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(*Food availability in Portuguese households with elders*)

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Dissertação para obtenção do grau de Doutor em Ciências do Consumo Alimentar e Nutrição apresentada à Faculdade de Ciências da Alimentação e Nutrição

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"Não é segurando nas asas que se ajuda um pássaro a voar.

O pássaro voa simplesmente porque o deixam ser pássaro."

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Resumo

O envelhecimento populacional e a necessidade de caracterização das condições de saúde e nutrição dos idosos constituem tema prioritário pelo seu impacto nos sectores social, económico e de saúde, bem como na qualidade de vida. A ausência de informações regulares sobre o consumo alimentar representa um dos entraves na caracterização das condições nutricionais da população Portuguesa, especialmente a idosa.

A presente investigação estima a disponibilidade alimentar em agregados domésticos privados Portugueses com idosos, para os anos de 1989-1990 a 2005-2006. A análise desta temática teve início com a elaboração de uma revisão bibliográfica tendo em vista identificar e resumir os documentos publicados entre 1970 e 2012 que utilizam os Inquéritos aos Orçamentos Familiares (IOFs) para analisar/descrever dados dietéticos em Portugal. Os outros três estudos analism amostras representativas dos domicílios com idosos (indivíduos com idade ≥ 65 anos), categorizados consoante a sua composição etária e de sexo em: idosa solitária, idoso solitário e casal de idosos (composto por um idoso do sexo feminino e um do sexo masculino).

Resultados da revisão revelaram que os dados alimentares dos IOFs em Portugal representam uma importante fonte da informação sobre a dieta a nível nacional, especialmente porque são regularmente produzidos. As lacunas do uso dos IOFs como fonte de dados alimentares relacionam-se com a subestimação das potencialidades desta fonte de dados. Outra lacuna identificada se refere ao desenvolvimento de trabalhos em sub-grupos da população e/ou que combinem perspectivas econométricas e nutricionais a fim de melhorar o sistema de monitorização das informações em nutrição de Portugal.

A disponibilidade alimentar e de nutrientes nos domicílios com idosos variou consoante o tipo de agregado. De uma forma geral, houve redução da disponibilidade alimentar per capita média de cereais, óleos/gorduras de adição, batatas e açúcar/produtos açucarados. Por outro lado observou-se aumento na disponibilidade de leite/produtos lácteos, frutas, água mineral, sucos de

frutas/vegetais e refrigerantes. Os domicílios de casais de idosos apresentaram os maiores valores médios para nove entre os quatorze grupos alimentares analisados. As idosas solitárias apresentaram maior disponibilidade de frutas e vegetais, características indicativas da preocupação feminina com questões de saúde e nutrição. Por outro lado, a maior disponibilidade de bebidas alcoólicas nos domicílios dos idosos solitários refletem, de alguma forma, a manutenção de hábitos culturais enraizados (consumo de álcool como parte da cultura mediterrânica) e/ou a situação de maior isolamento e solidão destes indivíduos. O valor energético total da dieta e a contribuição dos hidratos de carbono reduziram ao longo do tempo enquanto aumentaram a contribuição das proteínas e dos ácidos gordos saturados.

As características alimentares e nutricionais da disponibilidade de alimentos no interior dos agregados Portugueses com idosos revelam baixa qualidade dos alimentos disponíveis no agragregado familiar. Valores mais elevados do índice foram alcançados pelos domicílios de idosas solitárias e casal de idosos. A menor escolaridade do chefe da família e a localização do domicílio em áreas menos urbanizadas se associaram a uma disponibilidade de alimentos no agregado familiar mais saudável.

Os resultados desta investigação caracterizam a disponibilidade alimentar, o padrão alimentar dos domicílios com idosos e também identificaram que a disponibilidade de alimentos no domicílio, o tipo de agregado, o grau de urbanização do domicílio, o rendimento do agregado, os gastos com alimentação no domicílio e fora dele, foram as variáveis que mais impactaram sobre a contribuição relativa de cada grupo de alimentos no total de alimentos disponíveis nos domicílios

Os resultados apresentados podem ser empregues na construção de políticas nutricionais e de saúde especificamente direcionadas aos idosos. Ficou evidente que as diferenças nas características sociodemográficas dos domicílios e sua influência na disponibilidade alimentar precisam ser abordadas quando se deseja estruturar intervenções de nutrição em saúde pública. As informações do efeito simultâneo das variáveis estudadas sobre a contribuição relativa de cada grupo de alimentos no total de alimentos disponíveis nos domicílios podem servir de

base para identificar as motivações associadas à compra de alimentos bem como para estruturar estratégias de intervenção pautadas em evidência.

As características alimentares e nutricionais da população Portuguesa idosa ainda são pouco estudadas. Futuros estudos devem estender estes resultados, investigando possíveis mecanismos subjacentes dos determinantes sociodemográficos sobre a disponibilidade alimentar e sua qualidade, especialmente entre os mais velhos. Para além disto, a combinação dos resultados das análises dos dados dos inquéritos aos orçamentos familiares com medidas diretas de ingestão de alimentos poderia esclarecer ainda mais os hábitos alimentares das pessoas mais velhas, especialmente à luz da necessidade de incorporar a perspectiva de ciclo de vida.

Palavras-chave: disponibilidade alimentar, idosos, inquéritos aos orçamentos familiares, Portugal.

Abstract

The population ageing and the need to characterize the health and nutrition of the elderly group are a priority issue for its impact on the social, economic and health, as well as in the quality of life. The lack of regular information on food consumption is one of the obstacles in the characterization of the nutritional conditions of the Portuguese population, especially the elderly.

This research estimates the food availability in households with Portuguese elderly, for 1989-1990 to 2005-2006 years. The analysis began with a literature review in order to identify and summarize the documents published between 1970 and 2012 using the Household Budget Surveys (HBS) to analyze/describe Portuguese dietary data. The other three studies, analyzed representative sample of elderly households (those with ≥ 65 years of age), categorized according to their age and sex as: lonely elderly, elderly and lonely elderly couple (composed of an elderly female and sex male seniors).

Findings from the review revealed that Portuguese HBS dietary data are important national diet information sources, especially because they are regularly produced. The HBS gaps as a source of dietary data refers to the underestimation of its potential. Another identified gap relates to the development of works in population sub-groups and/or analyses combining econometric and nutritional perspectives in order to improve the Portuguese nutrition information system.

The elderly household's availability of food and the selected nutrients varied according to the household type. In general, a reduction on the average per capita of cereals, oils/added fats, potatoes and sugar/sugar products availability occurred. On the other hand, it was observed an increase of milk/milk products, fruits, mineral water, fruit and vegetal juices and soft drinks availability. The elderly couple households had the highest mean values for nine of the fourteen analyzed food groups. The solitary elderly female had higher availability of fruit

and vegetables, characteristics indicative of female's concern with health and nutrition issues. On the other hand, the increased availability of alcoholic beverages in solitary male households somehow may reflect attained cultural habits (alcohol consumption as part of Mediterranean culture) and/or the isolation and loneliness situation of these individuals. The diet energy and the carbohydrates contribution total energy decreased over time while the protein and saturated fatty acids contribution increased.

The dietary and nutritional characteristics of Portuguese elderly household food availability revealed low diet quality. Higher values of the diet quality were achieved by the solitary female household and elderly couple household types. Lower educational level of the household head and household location in less urbanized areas were associated with a healthier diet.

The results of this investigation characterize elderly household's food availability and dietary patterns and also identify the associated sociodemographic variables.

The household food availability, elderly household type, urbanization degree of the household, household income, food expenses and eating out expenses were variables that influenced most the relative food contribution for the total household food availability.

The presented results can be considered when addressing health and nutritional policies specifically designed for seniors. It was evidenced that the household sociodemographic differences and their influence on dietary availability need to be addressed when structuring public health nutrition interventions. The information of the simultaneous effect of the studied variables on relative the contribution of each food group in total food household food availability can be used as a basis for the identification of the food purchase motivations as well as for designing evidence based intervention strategies.

The Portuguese elderly dietary characteristics are still poorly studied. Future studies should extend these findings by investigating the possible mechanisms underlying sociodemographic determinants of food availability and diet quality, especially among the older people. Furthermore, the analysis of HBS dietary

data combining its results with direct food intake measurements could give further clarify to the elderly food habits, especially facing the need to incorporate the life course perspective.

Keywords: dietary availability, elderly, household budget surveys, Portugal.

Índice

1. Introdução

1.1. Envelhecimento populacional, condições de saúde e nutrição

O envelhecimento populacional, definido pelo aumento da proporção dos indivíduos com idade acima de 65 anos[1,2] em relação à população total, emerge como resultado quer da perda de importância relativa da população jovem ou da população em idade ativa, ou de ambas. O aumento da expectativa de vida e a redução da taxa de natalidade são apontados como fatores que contribuíram para o envelhecimento populacional. Análise da evolução destes dois fenómenos que marcaram esta conjuntura demográfica, especialmente nas duas últimas décadas do século XX e sua tendência de crescimento no tempo presente e no futuro próximo, revela a importância da população idosa[1-5].

O fenómeno de envelhecimento populacional vem ocorrendo ao redor do mundo de uma forma intensa e acelerada. O panorama atual não tem precedentes. Na Europa, dados para 2010, revelam que 17,4% de sua população era composta por idosos. Estimativas apontam que este contingente populacional deverá crescer e, em 2050 deverá corresponder a 30% da população total[3]. A dinâmica populacional portuguesa, à semelhança de outros países, também manifesta a crescente representatividade daqueles com idade igual ou superior a 65 anos. Estima-se que, atualmente, os idosos contabilizam 2 milhões de pessoas. Dados dos inquéritos das despesas das famílias para a edição de 2005-2006[6] revelam que 31,1% dos agregados familiares do país contavam com a presença de pelo menos um idoso, sendo 10% destes agregados compostos por idosos sozinhos. O índice de envelhecimento (razão entre a população com mais de 65 anos e a população até 14 anos) alcançou 131,3% no ano de 2011, quando em 1990 fora de 68,1%. Projeções de sua evolução para o ano de 2060 sinalizam que os valores poderão chegar a 348,5% para este país contra 207% para a Europa[7,8]. Considerando o significado dos idosos em relação à população total portuguesa, projeções indicam que, em 2050, este grupo etário corresponderá a 32% da população[9].

A importância da população idosa vai além das questões meramente demográficas. As transformações demográficas da população produzem profundos impactos em diferentes âmbitos, seja na estrutura política, social, económica e/ou sanitária dos países. Evidências científicas têm comprovado as consequências frente às necessidades sociais, políticas, económicas e de saúde[10-12]. No que concerne às condições de saúde, a magnitude das doenças crônicas degenerativas vem crescendo mundialmente[13-15], em parte como consequência do envelhecimento populacional. Estima-se que 63% das 57 milhões de mortes que ocorreram em 2008 foram decorrentes de doenças crónicas não transmissíveis sendo 48% atribuídas às doenças cardiovasculares, 21% a cancros, 12% às doenças respiratórias crônicas e 3% à diabetes[16]. No cenário Europeu, as doenças crônicas degenerativas também respondem pela maioria dos óbitos e em Portugal correspondem a 86% dos óbitos. As doenças cardiovasculares, cancros e as doenças respiratórias são apontadas como principais causas de morte neste país[8,15]. Em 2011 os dados desta nação indicam que 30,7% dos óbitos foram provocadas por doenças do aparelho circulatório e 24,8% por tumores malignos[7]. No âmbito da auto-apreciação sobre o estado de saúde, a tensão arterial alta, a doença reumática e a dor crónica são as queixas principais e morbilidades crónicas mais frequentes. Cerca de 53% da população apresenta inadequação do peso, dos quais 51,2% têm excesso de peso e/ou obesidade[17-19].

Diversos fatores são apontados como determinantes destas condições de saúde[13,20,21]. O aumento da esperança média de vida, a pressão arterial alta, o consumo de tabaco, a glicemia alta, a inatividade física, e o excesso de peso e obesidade são reconhecidos como fatores de risco globais para as doenças responsáveis pelas maiores taxas de mortalidade no mundo. As condições nutricionais e a inadequação alimentar também são reconhecidos como importantes fatores de risco. A relevância da obesidade e da baixa qualidade da dieta há muito vêm sendo identificadas como promotoras das doenças crónicas degenerativas no mundo industrializado. A obesidade já acomete cerca de 250 milhões de pessoas no mundo e a sua ocorrência tem sido associada ao aumento do consumo de alimentos processados e a inatividade física[22,23]. Estima-se que o consumo insuficiente de frutas e hortícolas seja

responsável por cerca de 14% das mortes por cancro gastrointestinal, 11% das mortes por doenças isquémicas do coração, totatlizando cerca de 9% das mortes em todo o mundo[13].

Tanto o processo de envelhecimento como o atual perfil de morbilidade e mortalidade ocorrem amparados sob intrincada influência de fatores intrínsecos e extrínsecos ao indivíduo. O estado de saúde está intimamente relacionado com o processo de envelhecimento e, do ponto de vista biológico, o processo de envelhecimento reflete as interações entre a herança genética e as influências ambientais. Entretanto, não resta dúvida que variáveis relacionadas com o estilo de vida influenciam fortemente não só o prolongamento dos anos de vida livres de doença como também, a manutenção da independência e bem-estar na velhice[24]. Neste sentido, cada vez mais se reconhece a importância de se caracterizar, acompanhar e intervir sobre os fatores de risco modificáveis, dos quais se destacam a atividade física e os aspectos relacionados com as características nutricionais e da dieta[13,25-27], especialmente quando se tem como propósito alcançar ganhos de anos de vida com qualidade, ou seja, vida longa, saudável, ativa e independente pelo maior tempo possível.

Embora ainda pairem dúvidas quanto à forma como as características nutricionais e alimentares interagem para a promoção do aumento dos anos de vida com saúde e independência nas idades mais avançadas, existem evidências científicas que reconhecem que as condições nutricionais actuam como um importante fator na transição da vulnerabilidade à fragilidade e dependência[27,28]. Daí advém a importância de se caracterizar as condições alimentares e nutricionais.

A análise do padrão alimentar vem sendo usada na pesquisa epidemiológica para a investigação das relações entre características da dieta e as condições de saúde. Resultados revelam que o padrão mediterrânico, caracterizado pela presença massiva de hortícolas, grãos integrais e alimentos fonte de ácidos gordos monoinsaturados, tem sido associado à melhoria nas condições de saúde e vida de indivíduos, mesmo em idades avançadas[29,30]. A adesão a este

padrão de dieta também foi associada com o aumento da longevidade em idosos[31,32].

As relações entre os padrões alimentares e as condições de saúde também vêm sendo investigadas através da identificação dos padrões de consumo e sua correlação com o crescimento da prevalência de doenças crônicasdegenerativas. Resultados de estudo sobre a dinâmica global das mudanças das características dietéticas[23] revelam a tendência universal para um maior consumo de gorduras (animais e as vegetais parcialmente hidrogenados) e menor consumo de fibra, características dietéticas associadas à crescente ocorrência das doenças crónicas não transmissíveis.

Em recente revisão sistemática, Mente *et al* (2009)[33] evidencia a estreita relação de risco entre a ingestão de ácidos gordos trans e alimentos com alto índice glicêmico com a ocorrência das doenças cardiovasculares. O mesmo estudo evidenciou o efeito protector do consumo de hortícolas, frutos secos e do padrão mediterrânico na ocorrência de doenças cardiovasculares. Dados europeus[34] revelam que a carga de doença atribuída às inadequações alimentares e nutricionais parecem ser substanciais e subestimadas. Recente estudo aplicando as recomendações nutricionais nórdicas no contexto da Rede EURRECA (European micronutrient Recommendations Aligned)[35] revelou que se encontravam inadequadas as quantidades de ácido fólico, selénio, iodo e vitaminas na dieta de Europeus. Em seus resultados também se discutem as implicações destas características sobre as condições de saúde e vida destas populações[36]. Outro estudo[37], retratando uma perspectiva global da ingestão de gorduras através da análise de dados de 28 países revelou grandes diferenças regionais com tendência para a elevada contribuição deste nutriente para o total de energia da dieta. Os resultados apontam que na Europa os ácidos gordos contribuíram entre 28,5 a 46,2% do total de energia da dieta, enquanto que em Portugal estes valores se encontravam entre 20 e 35%.

Em Portugal, os resultados disponíveis das características alimentares e nutricionais são compatíveis com as inadequações encontradas em outras localidades. A análise da evolução temporal da disponibilidade alimentar e

nutricional portuguesa para o período de 1966-2003 usando dados das folhas de balanço alimentar revelou aumento na disponibilidade de calorias e maior crescimento da contribuição das gorduras. A mesma tendência foi observada para os produtos de origem animal e para os hortícolas e frutas, embora menos expressiva para estes últimos. Por outro lado, produtos como azeite e vinho apresentaram tendência de decréscimo[38]. Outros estudos também reportam desequilíbrio no contributo dos macro nutrientes, elevado consumo de glícidos simples, sódio e energia total bem como reduzida ingestão de hidratos de carbono complexos, fibra e folato[17,19,39-42]. A análise da evolução temporal de índices de qualidade da dieta, nomeadamente, os relativos à adequação à dieta mediterrânea e aos objetivos para uma alimentação saudável preconizados pela OMS, demonstrou decréscimo na adesão a estes padrões[43]. As alterações observadas indicam que Portugal se afasta do padrão mediterrânico[42-44] e se aproxima do padrão alimentar mais ocidentalizado.

Apesar da existência de dados sobre as características da dieta portuguesa, existem lacunas que precisam ser preenchidas. A caracterização das condições nutricionais, particularmente no que se refere ao consumo alimentar e aos padrões dietéticos constituem tema fundamental[10,26,34,45,46]. A reconhecida importância da nutrição, sua relação com o envelhecimento e com o perfil de saúde[29,31,47,48,49,50] incrementam a importância e a necessidade de se identificar e monitorar as características nutricionais e alimentares dos idosos, sobretudo analisando-se dados com representatividade populacional. Corroboram para este cenário a necessidade de identificação de subgrupos em risco de desnutrição ou doença[49,51] e a compreensão de que medidas de nutrição em saúde pública precisam incorporar a perspectiva de curso de vida, ou seja, como se articulam os determinantes das condições de saúde e nutrição no decorrer da vida[20]. Neste cenário, merece especial atenção a busca do entendimento de como se realizam e se modificam ao longo do tempo as escolhas alimentares diante das características históricas, sociais e culturais[53].

1.2 Métodos e fontes de informação das características de consumo alimentar

A avaliação das características alimentares e nutricionais de indivíduos e populações é fundamental para apreciação das condições de saúde. Contudo, dada a complexidade do tema, exige-se reconhecer as possibilidades e limitações das fontes de informação disponíveis. A adequação do método esta diretamente relacionada com os ojetivos da proposta, tipo de dados necessários, recursos disponíveis e a população de interesse[54,55]. A recolha dos dados difere consoante ao nível de agregação da informação, individual e ou agrupados segundo país, famílias e ou grupos sociais, e o método de mensuração empregue. Estas características definem o que e, o quanto, se tem capacidade de mensurar, aspectos relacionados com o propósito do método. Informações sobre os aspectos que interferem na variabilidade da dieta, o tamanho da amostra investigada, a capacidade de comparação dos dados, a identificação dos possíveis fatores de confusão presentes e, a plausibilidade biológica dos achados são aspectos que também merecem atenção[55,56], especialmente tendo-se em conta que a avaliação do consumo alimentar é potencialmente sujeita a muitas fontes de erro tanto aleatório como sistemático. A capacidade de lembrar, por exemplo, pode influenciar o relato da dieta, problema recorrente entre indivíduos com idade mais avançada[57,58]. Existe também evidência de que os participantes de pesquisas possam ter a tendência de relatar o comportamento socialmente mais desejável, em vez de relatarem o real comportamento. Neste sentido, sempre que possível, quando se avalia a ingestão de alimentos, é importante identificar e quantificar as fontes de erros potenciais. Isto porque, os erros podem ser minimizados através do uso de procedimentos metodológicos específicos, na recolha e/ou análise dos dados[59].

Não obstante às dificuldades e limitações de cada um dos métodos empregues na caracterização do consumo alimentar, não pode ser questionado a relevância destas investigações. Entretanto, quando se quer selecionar o método mais eficaz para o acompanhamento do consumo de alimentos em nível populacional é importante identificar as vantagens e desvantagens das diferentes metodologias bem como, sua confiabilidae, validade,

disponibilidade[60], custo para obtenção dos dados e periodicidade com que são disponibilizadas as informações[61].

Informações sobre o consumo alimentar, consoante a sua aplicabilidade, podem ser obtidas em três diferentes níveis: dados de abastecimento de alimentos, em nível do país, dados do agregado familiar e dados do nível individual[55,60,62]. Ao nível individual, de forma direta, os instrumentos mais utilizados para aceder as informações sobre o consumo alimentar em pesquisas epidemiológicas são: o questionário de frequência alimentar, o registo ou diário alimentar e o recordatório de 24 horas. Indiretamente, se infere sobre o consumo alimentar através da análise das folhas de balanço alimentar e dos inquéritos aos orçamentos familiares que retratam a disponibilidade alimentar no domicílio[55,57,63].

Tendo em vista a caracterização e vigilância das condições alimentares e nutricionais o ideal seria que fossem realizados periodicamente inquéritos transversais individuais em amostras representativas em nível nacional. O levantamento resgataria informações sobre o consumo de alimentos (a partir do qual a ingestão de nutrientes seria calculada), estado nutricional e de saúde. Entretanto, na ausência de dados populacionais atualizados sobre o consumo alimentar individual, se empregam as folhas de balanço alimentar e os inquéritos aos orçamentos familiares. Enquanto os dados oriundos das folhas de balanço alimentar apresentam estimativas brutas do tipo e quantidade de alimentos disponíveis para consumo humano dentro de um país, os dados dos inquéritos aos orçamentos familiares retratam a disponibilidade alimentar no interior dos domicílios. Os resultados destes inquéritos descrevem a disponibilidade de alimentos e nutrientes e são reconhecidos como medidas indiretas do consumo alimentar[55,61,64].

1.3 Possibilidades e limitações dos inquéritos aos orçamentos familiares como fontes de informação da disponibilidade alimentar e nutricional

Os inquéritos aos orçamentos familiares captam o nível e estrutura de receitas e despesas dos agregados familiares (os padrões de consumo), bem como,

características demográficas, sociais e económicas dos agregados e de seus membros. Estes inquéritos têm por objectivo central especificar aspectos socioeconómicos e condições de vida da população tendo em vista a produção de indicadores económicos, tal como o índice de preços. De uma forma geral, são desenvolvidos a partir de amostragem em larga escala com representatividade nacional. Seus dados incluem a recolha de informações sobre as despesas de consumo dos agregados familiares de acordo com diferentes rúbricas do seu orçamento (exemplo: saúde, lazer, transporte, dentre outras) dentre as quais se destacam as informações das despesas com os alimentos e bebidas[65,66]. Os alimentos e bebidas que compõem a dieta no interior dos domicílios podem ser analisados tendo em vista a caracterização do padrão alimentar. A associação das características dietéticas identificadas com os dados sociodemográficos do agregado familiar oferecem a oportunidade de se inferir sobre os determinantes das escolhas alimentares. Assim, podem ser identificados alguns dos determinantes do padrão alimentar.

Os dados de alimentos e bebidas derivados dos inquéritos aos orçamentos familiares referem-se à identificação do item e da sua quantidade e/ou valor da despesa atribuído a cada um destes itens[65-67]. O consumo das famílias é dividido pelo número de habitantes no domicílio e a estimativa do consumo individual é frequentemente apresentada em quantidades *per capita* em termos absolutos e/ou segundo a contribuição do item alimentar para o total de alimentos disponíveis no domicílio. Assim, as informações dos alimentos e bebidas podem ser analisadas considerando os diferentes segmentos da população, principalmente a nível doméstico.

Formas mais especializadas dos inquéritos aos orçamentos familiares podem incluir a recolha de dados alimentares e de bebidas com diferentes graus de detalhe. Alguns inquéritos aos orçamentos familiares incorporam, numa sub-amostra da população, inquéritos diretos do consumo alimentar (com descrição detalhada sobre itens alimentares consumidos), outras informações sobre a comensalidade[62,68-70] e/ou detalhes sobre alimentos e bebidas adquiridos para o consumo fora do domicílio[71].

Como os inquéritos aos orçamentos familiares são realizados em intervalos regulares, os seus resultados também permitem a constituição e manutenção de sistemas de informação, que podem incluir a descrição dos padrões alimentares[69,73] e perfis nutricionais[73,74]. Existem estudos que recomendam e/ou reportam o uso desta fonte de informação para acompanhar as condições alimentares[57,77] e estabelecer políticas de alimentação e nutrição[57,64,75,76]. A estimação de informações individualizadas sobre o consumo alimentar também pode ser obtida a partir da combinação de procedimentos estatísticos e epidemiológicos, como por exemplo, através do uso de fatores de correção[70,74,].

Os inquéritos aos orçamentos familiares têm sido empregues para quantificar o consumo alimentar das famílias e de seus integrantes, em termos do consumo *per capita*, segundo: níveis de consumo de alimentos e nutrientes, densidade de nutrientes e dos alimentos, a qualidade da dieta e sua evolução temporal[68,76,77]. As informações advindas destes inquéritos também fornecem base para o estabelecimento de políticas alimentares, identificam as necessidades e prioridades para programas de alimentação. Adicionalmente, a caracterização dos perfis alimentares e nutricionais e dos determinantes sociodemográficos a partir dos dados dos inquéritos aos orçamentos familiares também podem auxiliar na identificação das práticas socioculturais da população, fornecendo dados que podem servir de referencia para o planeamento de programas de intervenção nutricional[57,61,67].

Entretanto existem limitações que devem ser levadas em conta. Os dados sobre a disponibilidade de alimentos, bebidas e nutrientes oriundos dos inquéritos aos orçamentos familiares podem não especificar a fração de alimentos e bebidas adquiridas mas, não consumidas por perda, desperdício e ou oferta a indivíduos visitantes. Outra limitação, refere-se ao fato de que não se consegue estimar adequadamente a real distribuição intra-familiar e a quantidade de alimentos ofertadas para animais de estimação. A falta de informação sobre as quantidades de alimentos e bebidas consumidos fora de casa também pode ser apontada como outra possível limitação[55,57,74,78,79]. A dificuldade de relatar os itens adquiridos, suas quantidades e valor gasto

também podem ser consideradas como possíveis fontes de erros nas estimativas de consumo de alimentos e bebidas oriundas dos inquéritos aos orçamentos familiares. As questões que envolvem a avaliação de exposições em epidemiologia nutricional apresentam muitas fontes de erro de medição e devem ser consideradas quando se analisam os dados alimentares e nutricionais dos inquéritos aos orçamentos familiares[59].

Entre idosos, outros fatores podem prejudicar o acesso aos dados alimentares obtidos por entrevista, especialmente os dos mais velhos (os com idade igual e superior a 85 anos). Estudo Europeu discute estes problemas e ressalta especificidades deste grupo, tais como: o fato do indivíduo ter pouco ou nenhum envolvimento na aquisição e/ou preparação de alimentos, a presença de comprometimento de memória e/ou questões cognitivas como fatores que podem limitar a capacidade de recordar o consumo, e ainda, limitações físicas que podem afetar a capacidade de ingestão alimentar[80,81].

Entretanto, salvaguardando-se as restrições, existem aspectos que estimulam o uso dos inquéritos aos orçamentos familiares como uma fonte de dados indiretos de consumo alimentar, mesmo em idosos. A possibilidade de articulação entre os dados alimentares e nutricionais com os dados sociodemográficos que os integram permite uma melhor caracterização do padrão dietético[76]. Esta é uma forte vantagem. A boa correlação de seus resultados com aqueles advindos de estudos que empregam medidas diretas do consumo alimentar tem dado ainda mais consistência a indicação dos inquéritos aos orçamentos familiares como fonte fiável para se aceder as características alimentares e nutricionais de populações[82-86]**.** Para alem disto, a periodicidade regular dos inquéritos aos orçamentos familiares tem preenchido a lacuna da ausência de estudos diretos do consumo alimentar. Estas situações tem reforçado o uso e a evolução das metodologias empregues pelos inquéritos aos orçamentos familiares como fonte de informação alimentar e nutricional[67,87,88]. O uso desta fonte de informação para analisar condições de subgrupos populacionais também vem sendo estimulado. Entretanto, em Portugal a disseminação do uso desta fonte ainda é pequena.

O uso das informações sobre a disponibilidade alimentar nos domicílios com idosos pode ser favorecido tendo em vista que os dados desta fonte reportam aspectos mais fatuais, a saber - a disponibiliade de itens alimentares e bebidas por compra, doação e/ou em estoque no domicílio, especialmente entre idosos que vivem sós e/ou administram o domicílio. Outro aspecto que também deve ser considerado é que a maioria dos idosos que ainda estão em seus domicílios são os mais jovens e/ou aqueles que, de alguma forma, ainda apresentam condições para viverem em seus domicílios. Por outro lado, os dados dos inquéritos aos orçamentos familiares podem não detalhar informações sobre as refeições prontas obtidas através de serviços de apoio social domiciliário, serviço oferecido aos idosos de Portugal[89].

Outro aspecto interessante é o fato dos idosos apresentarem maior consumo alimentar dentro do domicílio quando comparados aos adultos mais jovens[90-92]. Entretanto, vale destacar que vem sendo reportado o crescimento do consumo alimentar fora do domicílio[42,71,92].

1.4 Informações sobre o consumo alimentar disponíveis para a população Portuguesa

Em Portugal, os inquéritos nacionais de saúde, as folhas de balanço alimentar e os inquéritos aos orçamentos familiares são as principais fontes de dados das informações alimentares e nutricionais para a população em geral. Entretanto, os estudos de avaliação alimentar empregando medidas diretas da ingestão alimentar em amostras representativas da população são escassos[17,39,93-100] especialmente aqueles com representatividade nacional para população total[93-96] e/ou de sub-grupos da população[41,39,96,101,102].

Dados alimentares e nutricionais dos inquéritos aos orçamentos familiares, têm sido utilizados para analisar a disponibilidade domiciliar de alimentos, definir padrões e qualidade da dieta em nível populacional neste país[43,44,64,68,75,103]. Os resultados destes estudos, para além de servirem de base para comparações e construção de séries temporais no país também vem sendo comparados com os de outras localidades, tendo-se em vista a

similaridade das metodologias empregues pelos inquéritos aos orçamentos familiares e a harmonização dos dados alimentares[57,64,68,76,77].

Conceitualmente, a identificação de padrões alimentares representam uma visão mais global dos alimentos e nutrientes componentes da dieta o que pode ser mais preditivo que o alimento e/ou o nutriente isolado, em termos do risco de desenvolvimento de doenças. A identificação dos padrões a partir de índices de qualidade da dieta (*a priori*) ou análise dos dados para extração de padrões usando procedimentos estatísticos (*a posteriori*) são os métodos mais usados[32,51,52,68,104,105]. A identificação de padrões alimentares da população Portuguesa a partir dos dados dos inquéritos aos orçamentos familiares[43,44] tem empregue essencialmente a abordagem dos índices de qualidade alimentar. Para além desta abordagem, a descrição dos itens alimentares e bebidas segundo sua disponibilidade *per capita,* absoluta ou relativa, vem sendo empregue na tentativa de apresentar os elementos complexos que compõem as dietas consumidas por indivíduos que vivem na comunidade[42,44,79,106].

Entretanto, o emprego dos inquéritos aos orçamentos familiares para analisar as características alimentares e nutricionais em sub-grupos populacionais ainda é restrito em Portugal. Considerando-se especificamente os idosos, crescente contingente populacional deste país, localizou-se apenas um estudo retratando a disponibilidade de alimentos e nutrientes para edição de 2000 dos inquéritos aos orçamentos familiares[107].

Se as informações regulares sobre o padrão de consumo alimentar da população portuguesa são escassas, o contorno é ainda mais alarmante para a população de idosos. São poucos os estudos que descrevem especificamente sua situação alimentar e nutricional neste país[100]. Os dados disponíveis referem-se essencialmente a amostras não representativas da população[80,108-110,] e/ou sobre indivíduos institucionalizados[111,112], o que não reflecte as condições daqueles idosos que se encontram na comunidade.

A escassez dos dados sobre as características nutricionais e do padrão alimentar da população e de seus subgrupos mais significativos, como os

idosos, pode prejudicar a construção de recomendações alimentares e nutricionais baseadas em evidências científicas, especialmente aquelas pautadas nos alimentos consumidos, directriz indicada por organismos nacionais e internacionais. Esta lacuna encontra-se na agenda sanitária e política[12,46,87] através de iniciativas que estimulam a agregação e recolha sistemática de indicadores do estado nutricional, do consumo alimentar e de seus determinantes para identificar a situação alimentar e nutricional[113]. A potencialização do uso dos dados sociais, nutricionais e alimentares disponíveis também vem sendo ressaltado[114]. Neste contexto, o uso dos inquéritos aos orçamentos familiares como fonte de informação para caracterizar a dieta dos idosos pode constituir-se importante estratégia.

A necessidade e a importância de se caracterizar os dados alimentares e nutricionais deste subgrupo populacional ultrapassam sua crescente representatividade diante da população geral. O interesse também vem aumentando tendo-se em vista considerações metodológicas[50] relacionadas com os efeitos cumulativos da dieta durante um período prolongado e a frequência elevada de resultados indesejáveis como consequência da exposição que tiveram ao longo da vida. Outro aspecto que também reforça a importância destes dados é o fato de se reconhecer que a inadequação representa relevante fator de risco modificável para a transição entre o declínio funcional e a instalação de deficiências mais graves[27], especialmente quando se quer assegurar o envelhecimento bem sucedido e minimizar o efeitos das doenças e incapacidades.

1.5 Determinantes do consumo alimentar de idosos

Diversos são os fatores que afetam as características da dieta e as condições de saúde da população geral. Entre os idosos, os efeitos dos diferentes determinantes podem ser enfatizados pela ação cumulativa da exposição ao longo de suas vidas. As necessidades nutricionais, a disponibilidade e preço dos itens alimentares, bem como, os aspectos relacionados como os contextos sociais, económicos e culturais são alguns dos fatores determinantes das escolhas alimentares[115] e da características alimentares e nutricionais[24,116,117].

Os fatores determinantes envolvidos interagem de uma forma intrincada perpassando por diferentes aspectos, cujos mecanismos são muitas vezes desconhecidos.

Embora não se tenha esclarecido o mecanismo de ação, sabe-se que desigualdades de renda, educação, habitação e emprego afetam as condições nutricionais e de saúde da população, tanto diretamente como indiretamente, através de fatores psicossociais (como o stress). Indivíduos pertencentes às camadas inferiores da escala social são mais propensos a apresentarem problemas de saúde comparativamente àqueles pertencentes às escalas sociais mais elevadas[118-119]. Isto porque existe um diferencial na capacidade de acesso aos aspectos relacionados com estilo de vida. Assim, as desigualdades socioeconómicas materializam-se através de desajustes nas condições de moradia, trabalho, prática de exercício físico, consumo alimentar, de álcool e de tabaco e impactam sobre as condições de saúde[87,120]. Por terem mais baixo nível de renda estes indivíduos podem ser forçados a darem maior prioridade ao preço e a familiaridade com os itens alimentares ao invés de se centrarem nas preocupações com a saúde, fato que pode explicar a maior associação da baixa qualidade alimentar com baixos níveis de renda[121-122].

A composição do agregado familiar, seja pelo número de seus constituintes, sexo, e/ou o seu perfil etário, também parece influenciar o padrão alimentar[42]. Homens e mulheres apresentam diferenças no consumo alimentar, característica também demarcada entre idosos[123]. Observa-se redução no consumo alimentar ente indivíduos com idades mais avançadas[47]. Achados indicam ainda que os indivíduos idosos que vivem sós e que pertencem ao estrato social mais baixo podem estar mais propensos a apresentarem piores condições nutricionais e alimentares[80].

Diferenças quanto a disponibilidade dos pontos de venda de alimentos e o domicílio também podem ser apontadas como aspectos sócio-demográficos que se relacionam como as características do consumo alimentar. Resultados de estudo caracterizando os ambientes de venda de alimentos e o consumo de

frutas e vegetais, relata associação negativa entre a distância dos pontos de venda e o consumo destes alimentos nos residentes de localidades rurais[124].

O tempo da exposição aos diferencias das características sociodemográficas também merecem atenção, especialmente consideram-se a perspectiva de ciclo vital. As diferenças nas exposições ao longo do curso de vida, por exemplo, as posições sociais e as suas consequências parecem também interferir. As vantagens e/ou desvantagens socioeconómicas às quais os indivíduos foram expostos tendem a acumular-se longitudinalmente produzindo impacto nas condições atuais e futuras[119] de saúde e nutrição.

A cultura na qual os indivíduos são educados também pode influenciar muito as escolhas alimentares. As interacções sociais e características do local de residência de alguma forma também participam da mediação dos itens alimentares que estarão disponíveis para o consumo influindo sobre as características alimentares de grupos populacionais[125,126].

Entre os idosos, as características alimentares relacionadas com a escolha de alimentos também são afetados pelo estado de saúde, pelas mudanças biológicas e funcionais provocadas pelo envelhecimento, condições mediadas por fatores familiares, sociais, culturais e económicos[47,48,50,108,110,127,128]. Infere-se que o consumo de bens alimentares varie também em função das modificações ocorridas no seio da estrutura social e demográfica de uma sociedade. Desta forma, o padrão de consumo daqueles com idades mais avançadas também reflete o impacto destas transformações.

Estudo analisando padrões alimentares e sua correlação com aspectos sóciodemográficos e de estilo de vida entre idosos Europeus[50] revelou que os padrões "de base vegetal" e "de dietas ricas em doces e gorduras" como os mais predominantes entre idosos. Os padrões encontrados correlacionavam-se com características sociodemográficas, dado também apontado por outros estudos[24,105], onde os padrões mais saudáveis se correlacionam com níveis socioeconómicos mais elevados[108,129].

Os determinantes das características alimentares da população idosa Portuguesa vêm sendo estudados[108,110,128]. Entretanto, ainda não se tem claro

como os diferentes fatores se caracterizam e interagem na determinação do perfil de consumo destes indivíduos. Resultados retratando a perspectiva dos idosos Portugueses sobre a aquisição, preparo e consumo de alimentos referem os baixos recursos económicos, a baixa literacia e a presença de incapacidades físicas como fatores que podem contribuir para aumento do risco de condições nutricionais e alimentares desfavoráveis[80]. O tempo disponível para aquisição, a distancia e características dos locais de venda, condições de saúde e autonomia dos idosos também são apontados como fatores associados ao perfil do consumidor sénior deste país[80,130]. Quando comparados com idosos de outros países Europeus, os portugueses apresentam grande queda do poder de compra e aumento da proporção dos gastos com alimentação e bebidas com o avançar da idade[131].

As especificidades dos idosos têm vindo a ser objeto de interesse nos últimos anos. Entretanto, ainda são poucos os trabalhos realizados em Portugal que apontam os fatores associados ao consumo alimentar de idosos, sobretudo em amostras representativas da população.

2. Objetivos

Objetivo geral

Estimar a disponibilidade alimentar e nutricional em agregados domésticos privados Portugueses com idosos, para os anos de 1990/1991 a 2005/2006.

Objetivos específicos

- Caracterizar a disponibilidade alimentar dos agregados domésticos privados Portugueses com idosos;
- Caracterizar a disponibilidade de energia e participação relativa de macro-nutrientes e de nutrientes selecionados dos agregados domésticos privados Portugueses com idosos;
- Apresentar a evolução da disponibilidade alimentar e nutricional dos agregados domésticos privados Portugueses com idosos;
- Identificar a associação entre a disponibilidade alimentar dos agregados domésticos privados Portugueses com idosos com suas características sociodemográficas;
- Disponibilizar dados que fundamentem a construção de medidas de nutrição em Saúde Pública direccionadas aos idosos com a perspectiva de promoção da saúde.

3 População e Métodos

3.1 Base de dados, desenho de estudo e amostra

As bases de dados empregues, os inquéritos aos orçamentos familiares (IOF), desenvolvidos entre 1989-1990 e 2005-2006, originam-se da observação sistemática das despesas familiares desenvolvidas pelo Instituto Nacional de Estatística de Portugal (INE). Estes inquéritos mensuram a cada cinco anos as estruturas de consumo das famílias e possibilitam traçar um perfil das condições de vida da população a partir da análise de seus orçamentos domésticos. Os ojetivos desta investigação integram a determinação da estrutura de consumo para cálculo dos ponderadores do Índice de preços, o fornecimento de informação sobre o consumo final das famílias às contas nacionais Portuguesas, o fornecimento de informações necessárias à construção da Balança Alimentar e avaliar as fontes e valor dos rendimentos dos indivíduos[65].

Tratam-se de estudos do tipo transversal, com representatividade nacional graças a amostragem probabilística obtida por múltiplos estádios baseada nos dados dos censos Portugueses. A unidade primária de amostragem corresponde às regiões demarcadas segundo a nomenclatura estatística de unidades territoriais no nível II – NUTS2 e a secundária, os domicílios de cada área, conforme especificado nos dados censitários. O agregado domiciliar privado é a unidade básica de análise e corresponde ao conjunto de indivíduos, parentes ou não, que residem sobre o mesmo alojamento e que partilham gastos básicos, nomeadamente, alimentação e alojamento. Detalhes metodológicos destes estudos são descritos no quadro 1[132-139].

Quadro 1: Resumo das características metodológicas dos inquéritos aos orçamentos familiares de 1990/1991 a 2005/2006*.

Características	**Data da condução dos inquéritos aos orçamentos familiares**			
	1989-1990	**1994-1995**	**2000-2001**	**2005-2006**
Base da amostra	Censo 1981	Censo 1991		
Amostragem	Probabilística por múltiplo estágio com representatividade populacional para Portugal continental e Regiões autónomas			
Unidade de amostra	Agregado familiar/Agregado doméstico privado – pessoa ou grupo de pessoas que partilham a casa e alimentos no âmbito privado			
Nº. Domicílios	12403	10554	10020	10403
Taxa de resposta (%)	Sem informação	77,3	73,2	62
Período (mês/ano) [1]	03/89-03/90	10/94-10/95	01/00-14/01	10/05-10/06
Método de recolha da disponibilidade de alimentos	Auto registo diário (*per capita*) de aquisição alimentar			
Período de recolha	1 Semana	14 Dias		

*Baseado em Staveren *et al*, 1991[57].

1- Recolha conduzida ao longo do ano para contemplar variações advindas da sazonalidade.

A presente investigação analisa os dados alimentares e sociodemográficos dos domicílios com idosos, aqueles com indivíduos com idade igual ou superior a 65 anos[1]. Foram selecionados como grupos de interesse os domicílios que apresentam idosos solitários e aos pares especificando também a sua composição segundo sexo, a saber: idosa solitária, idoso solitário e casal de idosos (homem e mulher). Sempre que pretende compara-se a situação dos agregados com idosos com a dos adultos (indivíduos com idade entre 19 e 64 anos) empregando-se a mesma estratificação, a saber: adulta solitária, adulto solitário e casal de adultos (homem e mulher). O quadro 2 apresenta detalhes sobre a amostra seleccionada (número amostrado e as estimativas populacionais), de acordo com cada uma das estratificações empregues.

Quadro 2: Descrição do total de domicílios segundo estratificação empregue na análise da disponibilidade alimentar e nutrcional dos domicílios com idosos e com adultos - Inquéritos aos Orçamentos Familiares (IOF), versões de 1990, 1995, 2000 e 2005.

Estratificação dos domicílios	Versões dos IOF							
	1990		1995		2000		2005	
	n	N	n	N	n	N	n	N
Idosas solitárias	744	189183	824	258265	1027	345857	913	293858
Idosos solitários	204	53506	242	69608	296	86283	281	91997
Casal de idosos	1019	548646	1153	732542	1210	778036	1247	719859
Adultas solitárias	354	95282	284	85841	336	131209	345	130232
Adultos solitários	122	29505	180	47099	162	59358	292	124459
Casal de adultos	1290	704596	905	555972	972	699258	1216	859609

n= número de domicílios amostrados; N= número de individuos segundo estimativas populacionais.

3.2 Características dos dados alimentares provenientes dos inquéritos aos orçamentos familiares e procedimentos para a sua harmonização

Os dados da disponibilidade alimentar e de bebidas nos domicílios foram recolhidos através do registo diário de todas as despesas efetuadas por cada membro do agregado durante duas semanas e, excepcionalmente, durante uma semana para a edição de 1990 do inquérito aos orçamentos familiares. As aquisições alimentares representam os itens comprados, oferecidos e oriundos de produção própria (os dois últimos identificados como despesas não monetárias). O consumo de alimentos fora do domicílio é expresso pelo valor unitário pago segundo o tipo de refeição, alimento consumido (refeição completa, lanches, café, bebidas não-alcóolicas e bebidas alcóolicas) e local de sua realização. Estes dados não foram incluídos nas análises porque apenas um número reduzido de itens alimentares apresentam descrição detalhada. Todos os dados dos itens alimentares e bebidas obtidos foram estruturados e seus códigos são apresentados de acordo com a Classificação do Consumo Individual por Objectivo (COICOP), compondo aproximadamente 500 itens para cada uma das versões empregues no que concerne especialmente aos alimentos disponíveis no domicílio.

Na sua origem, a base de dados encontra-se organizada segundo o ano da investigação, disposta em três ficheiros. O primeiro contém os dados dos agregados familiares, o segundo apresenta as informações sociais de cada um dos integrantes do agregado e o terceiro encerra, para cada um dos agregados inquiridos, os valores pagos e as quantidades adquiridas de alimentos e bebidas. As características gerais das variáveis de cada um dos ficheiros disponibilizados pelo Instituto Nacional de Estatística para os dados de 2005, encontram-se no anexo 1.

Diferentes procedimentos foram empregues para o uso dos dados. Inicialmente procedeu-se a identificação das variáveis de interesse e estruturação das definições empregues. Em seguida, conforme procedimentos adotados para as edições de 1990 a 2000[140], foi realizada para edição mais recente IOF 2005/2006 uma descrição dos arquivos e das variáveis, seguida da tradução para a língua Inglesa e inclusão dos itens alimentares e bebidas que

não haviam sido descritos como adquiridos pelos domicílios nas edições anteriores.

Os dados dos alimentos e bebidas associados aos diferentes códigos (COICOP) foram traduzidos para a língua Inglesa e reorganizados conforme recomendação para agregação de dados alimentares do DAFNE[68,140,141]. Os códigos empregues para harmonizar os dados dos alimentos identificados nas versões dos inquéritos aos orçamentos familiares estão descritos segundo os grupos e subgrupos em anexo 2.

A conversão de dados de aquisições de itens alimentares que não apresentavam identificação correspondente em cada uma das listas para harmonização foi realizada a partir da atribuição de um código e posterior cálculo do valor nutricional. A recodificação foi realizada a partir da identificação do grupo alimentar ao qual o item pertencia.

O cálculo dos valores nutricionais associados a cada um dos itens alimentares e bebidas disponíveis nos dados dos inquéritos aos orçamentos familiares foi realizado com o auxílio do programa MicrodietPlus para Windows versão 1.1 2000, adaptado para incluir atualizações de valores nutricionais descritos nas tabelas de composição de Alimentos Portuguesa[142] e Inglesa[143]. Quando as tabelas de composição alimentar de referência não apresentavam os dados nutricionais do alimento sob análise, acedeu-se aos dados da tabela Americana[144].

Tomou-se como referência para o cálculo nutricional os valores dos alimentos crus, os semi-preparados e prontos a comer, conforme descrição de cada um dos itens e a disponibilidade dos dados nas tabelas de composição empregues. A conversão das unidades de medida nomeadamente, quantificação das porções individuais e a identificação da participação de ingredientes dos alimentos prontos a comer e dos alimentos semi-preparados (cálculo de receitas) tomou como referência a proporção dos ingredientes, conforme critérios anteriormente empregues[68,140,141]. O cálculo também levou em conta a necessidade de agregação de itens alimentares em grupos com maior abrangência e a conversão de unidades de medidas de massa para volume e

valores atribuídos a unidades/porções conforme valores de conversão propostos por estudos desenvolvidos em Portugal[145,146].

Ao final, apresentam-se agrupados 14 grandes grupos alimentares, um leve desvio do agrupamento proposto pela classificação DAFNE[141]. Isto porque os sucos de hortícolas e de frutas se encontram sob o grupo maior de bebidas não alcoólicas, não separadamente, respeitando-se procedimentos empregues em análises anteriores de dados alimentares e nutricionais oriundos dos inquéritos aos orçamentos familiares de Portugal[72,140]. Desta forma, esta investigação descreve dados dos seguintes grupos alimentares: cereais (cereais e produtos à base de cereais), carne/produtos à base de carne, peixes/marisco, ovos, leite/produtos lácteos, óleos/gorduras de adição, batatas, leguminosas, frutos secos, hortícolas, frutas, açúcar/produtos açucarados, bebidas não alcoólicas e bebidas alcoólicas. O quadro 3, descreve os itens alimentares que integram os grandes agrupamentos.

Quadro 3: Agrupamento dos alimentos

Grandes grupos	**Itens alimentares que integram os grandes grupos**
Cereais e produtos a base de cereais	Pães, outros produtos de panificação, arroz, cereais e produtos cereais (excepto farinha e massa), farinhas, massas.
Carnes/produtos de carne	Carnes vermelhas (carne de porco, carne de bovinos e novilho, outros tipos de carne vermelha, miúdos), frango e aves, carne enlatada e produtos a base de carne.
Peixes/frutos do mar	Peixes, frutos do mar, pratos a base de pescados.
Ovos	Ovos.
Leite/produtos lácteos	Leite, queijos, produtos a base de leite.
Óleos/gorduras de adição	Lípidos de origem animal (manteiga, gordura animal), lípidos de origem vegetal (margarinas, gordura vegetal para espalhar, azeite, outros óleos vegetais).
Batatas	Batata e outros tubérculos ricos em amido.
Leguminosas	Feijões, lentilha, grão-de-bico, etc.
Nozes	Amêndoa, nozes, amendoim, etc.

Continuação do Quadro 3: Agrupamento dos alimentos

Grandes grupos	Itens alimentares que integram os grandes grupos
Hortícolas	Hortícolas folhosas, crucíferos, tomates, cenouras, cebolas, alho e alho francês, outros vegetais frescos, vegetais processados,
Frutas	Frutas frescas (maças, frutos cítricos, bananas, uvas, ameixa, frutos vermelhos, pêssego e nectarina, cereja, peras, outras frutas frescas, frutas processadas.
Açúcar/produtos açucarados	Açúcar, mel, achocolatados, etc.
Bebidas não alcoólicas	Estimulantes - café, chá e cacau; água mineral, sumos de frutas/vegetais e refrigerantes
Bebidas alcoólicas	Vinho, cerveja e bebidas espirituosas.

A base de dados dos alimentos na sua estrutura final conta com a identificação (segundo cada um dos itens alimentares): quantidades relacionadas (somatório das quantidades conforme as diferentes formas de aquisição), valores monetários, e valores nutricionais. Após a estruturação da base alimentar, procedeu-se à transposição dos dados. Em seguida, procedeu-se a junção destes dados com os das demais informações sociais e demográficas de cada um dos domicílios.

3.3 Indicadores da disponibilidade alimentar e nutricional

A definição do indicador da disponibilidade alimentar e de bebidas enquanto medida que sumariza em cifras tangíveis e operacionais das características relevantes do consumo alimentar e de bebidas de grupos populacionais requer, em primeira instância, o entendimento do que temos capacidade de mensurar a partir dos inquéritos aos orçamentos familiares.

Os inquéritos aos orçamentos familiares descrevem os itens alimentares e bebidas em termos de sua quantidade e/ou valor da despesa atribuído a cada um destes itens[65-67,72]. Detalhes descritivos sobre os dados empregues nesta investigação, a saber, forma de recolha, número de itens alimentares segundo cada uma das edições e os itens integrantes dos grupos de alimentos e bebidas, se encontram no anexo 2.

A presente dissertação emprega como indicadores da disponibilidade alimentar a quantidade do item alimentar disponível no domicílio (g *per capita*/dia) e o seu contributo para o total de alimentos no domicílio (% do item alimentar em relação ao total de alimentos e bebidas no domicílio em kg) em quantidades per capita. As quantidades de alimentos, bebidas e nutrientes disponíveis para consumo por cada membro do domicílio, a disponibilidade (absoluta e relativa) diária *per capita*, foi calculada dividindo-se a disponibilidade total diária no domicílio pelo número de membros do agregado. As características nutricionais investigadas descrevem-se através do total energético diário (kJ/pessoa/dia) e da disponibilidade de nutrientes (expressos em peso em gramas ou proporção do total da energia) disponível no agregado familiar, a saber: gramas de proteínas, lípidos com identificação dos diferentes tipos (ácidos gordos monoinsaturados, ácidos gordos saturados, ácidos gordos polinsaturados, colesterol) e hidratos de carbono com especificação dos açúcares simples.

A análise do padrão alimentar e nutricional, uma visão mais global dos alimentos e nutrientes que integram a dieta, vem sendo recomendada como abordagem interessante quando se quer caracterizar o perfil de uma população tendo em vista a associação deste perfil com condições de morbilidade e mortalidade[32,105,147-148] e também com características sociodemográficas[148]. A obtenção de padrões alimentares vem sendo realizada *a priori*, através de índices de qualidade de dieta definidos a partir de recomendações se relacionam com a prevenção de doenças, ou, *a posteriori*, com a definição dos padrões a partir do uso de métodos estatísticos que exploram nos dados características alimentares semelhantes de grupos de indivíduos[32,105,148].

Na presente investigação, avalia-se a qualidade da dieta tendo-se como referencia critérios pautados nas recomendações da Organização Mundial da Saúde para uma alimentação saudável[25,26]. O índice de qualidade da dieta revisado – *Health Diet Indicator* (HDI) adaptado por Rodrigues (2007)[43], corresponde a uma adaptação do índice proposto por Huijbregts *et al* (1997)[49]. O quadro 4 apresenta os critérios empregues em cada um dos itens do indicador. O cômputo da qualidade da dieta é realizado através da verificação

ao atendimento a cada um dos itens propostos no que se refere a disponibilidade dietética diária sendo atribuído um ponto a cada item atendido e zero ponto para o não atendimento. A contagem da qualidade da dieta pode variar entre zero e 12 pontos máximos. Estes valores serviram para classificar a qualidade da dieta como baixa (HDI ≤ 4), intermediária (HDI 5-6) e alta (HDI ≥ 7)[43].

Quadro 4: Critérios de cada um dos itens do índice de qualidade da dieta revisado – *Health Diet Indicator* (HDIr)*.

Critérios do HDIr *
10-15% Energia das proteínas
50-70% Energia dos hidratos de carbono
< 10% Energia dos açúcares simples
< 10% Energia dos ácidos gordos saturados
6-10% Energia dos ácidos gordos polinsaturados
< 300 mg Colesterol
> 25 g Fibra
≥ 400 g Frutas e hortícolas
≥ 30 g Leguminosas e frutos secos
< 200 mg sódio
< 4% Energia de álcool

* Critérios propostos por Huijbregts *et al* 1997[49] e revistos por Rodrigues *et al* (2007)[43].

Outro aspecto importante é a possibilidade de comparar os resultados ao longo do tempo e entre localidades. Neste sentido, iniciativas internacionais vem propondo harmonização de indicadores[57,61,147].

3.4 Variáveis sociodemográficas

As variáveis sociodemográficas serviram para caracterizar o bem-estar social e estilo de vida dos domicílios investigados. Estes dados foram harmonizados conforme recomendações do DAFNE, descritos no anexo 3.

As variáveis foram estratificadas consoante os interesses de cada um dos estudos desenvolvidos, conforme descrito em cada um dos artigos. Apresenta-se a seguir, de forma mais geral, as variáveis e definições empregues para as variáveis idade, sexo, nível de educação do responsável do domicílio e gasto com alimentação.

Conforme referido anteriormente, se define idoso como o indivíduo com idade ≥ 65 anos[1], adultos os indivíduos com idade entre 19 anos e 64 anos e crianças indivíduos com idade ≤18 anos. A composição etária dos membros do domicílio foi analisada pela contribuição de cada faixa etária em relação ao total de indivíduos do agregado, descrita como % de idosos, adultos e crianças.

As variáveis sexo e idade (indivíduos idosos e adultos) foram empregues para caracterizar o tipo do domicílio, a saber: domicílios com idosas solitárias, idosos solitários, domicílios de casal de idosos, estes compostos por um homem e uma mulher. A mesma estratificação foi empregue para seleção dos agregados com adultos, conforme referido no item 3.1.

O nível de educação do responsável do agregado foi classificado consoante o nível de literacia por ele informado, a saber: analfabeto/primário (indivíduo sem educação formal e/ou que apresenta até 6 anos de educação formal); secundário (indivíduo que apresenta dos 7 aos 12 anos de educação formal) e superior (indivíduo com bacharelado, mestrado e/ou doutorado).

Os rendimentos correspondem aos valores monetários recebidos de qualquer fonte a nível do agregado familiar e são expressos em Euros *per capita*/dia. Os gastos com alimentação referem-se à proporção dos gastos totais do domicílio com compras de alimentos e bebidas (%) enquanto os gastos com alimentos fora do domicílio referem-se à proporção dos gastos com alimentos e bebidas consumidos fora do âmbito doméstico, em bares, hotéis, restaurantes, cafés e outros estabelecimentos similares (%).

A localização dos domicílios se descrevem segundo as regiões demarcadas para fins estatísticos - NUTS 2 de Portugal, a saber: Norte, Centro, Lisboa e Vale do Tejo, Alentejo, Algarve, Açores e Madeira. O nível de urbanização do local do domicílio se descreve como: rural, semi-urbano e urbano.

3.5 Análise estatística

A análise estatística foi conduzida levando-se em conta a complexidade do processo de amostragem. Os artigos integrantes da presente tese de doutoramento incluem como estatística descritiva o cálculo da média, erro padrão (SE), mediana, quartis e frequências. O emprego do SE pautou-se no interesse em indicar a imprecisão associada à estimativa da média[149]. As diferenças entre os grupos foram estudadas através dos testes de Mann-Whitney, Kruskal-Wallis e qui-quadrado, consoante a natureza das variáveis sob análise. Coeficientes de correlação de Spearman e os coeficientes obtidos em de regressões logísticas foram calculados para avaliar as tendências temporais observando-se a associação entre o ano do inquérito e cada variável.

O modelo de regressão linear pelo método de recuo passo-a-passo serviu para analisar as relações entre a qualidade da dieta, mensuradas através do índice de qualidade da dieta revisto – HDIr[43], com as variáveis sociodemográficas. Utilizou-se uma transformação logarítmica em variáveis contínuas com valores positivos do coeficiente disimetria. As regiões portuguesas e níveis de urbanização foram recodificados como variáveis *dummy* assumindo Norte e urbano como categorias de referência, respectivamente. A existência de associação monotônica entre HDIr e cada uma das características sociodemográficas (nível de escolaridade do chefe da família, rendimento, despesas alimentares fora de casa, localização do domicílio e nível de urbanização) foi analisada através do coeficiente de correlação tau de Kendall. Os modelos de regressão empregues cumpriram a suposição de normalidade do termo de erro[150].

A análise de variância multivariada (MANOVA), usando um modelo linear geral (GLM), foi aplicada para analisar os efeitos simultâneos de variáveis sociodemográficas e do tempo sobre a contribuição relativa de cada grupo de alimentos no total de alimentos disponíveis nos domicílios. As variáveis analisadas foram: tipo de domicílios de idosos, escolaridade do responsável do domicílio, ano do inquérito, grau de urbanização do domicílio e localização de acordo com as regiões portuguesas. Os totais de alimentos disponíveis no

domicílio, o rendimento, as despesas com alimentação e com os alimentos consumidos fora do domicílio foram inseridos no modelo como covariáveis. A análise do tamanho do efeito foi realizada a partir dos valores parciais do Pillai eta quadrado (η2) usando-se os critérios qualitativos propostos pelo teste de Cohen (f) (1988)[151], conforme descrito na tabela 1.

Tabela 1: Critérios para a análise qualitativa do tamanho do efeito.

Tamanho do Efeito	Valores correspondentes	
	teste de Cohen[a] f	Valores de eta quadrado[b] η2
Pequeno	0.10	0.009
Médio	0.25	0.058
Grande	0.40	0.137

a- Valores do tamanho de efeito proposto por Cohen, J. (1988)[151].

b- Foram usados como pontos de corte os valores de 0,035 e 0,100 para dividir as classificações de η2 em pequeno e médio, e de médio e grande, respectivamente.

As análises consideraram testes bilaterais adoptando-se, 0,05 como nível de significância. O IBM SPSS Statistics versão 20.0 foi usado para a elaboração das análises.

3.6 Aspectos éticos

Acedeu-se aos bancos de dados dos Inquéritos aos Orçamentos Familiares através de acreditação de investigador ao Gabinete de Planeamento, Estratégia, Avaliação e Relações Internacionais do Ministério da Ciência, Tecnologia e Ensino Superior (GPEARI-MCTES). Este procedimento possibilita o uso, por concessão, de dados estatísticos para fins de investigação científica e

integra protocolo entre o Instituto Nacional de Estatística e a Fundação para Ciência e Tecnologia e o GPEARI-MCTES. A concessão dos dados e sua utilização exigiu a consolidação de compromisso por parte da equipa envolvida nesta investigação em relação ao cumprimento dos requisitos previstos no código de conduta, tendo em vista a garantia da confidencialidade e respeito às normas para a divulgação, bem como atenção aos demais critérios éticos previstos.

A presente investigação não apresenta conflito de interesse real, potencial ou aparente por nenhum de seus autores e utilizou dados secundários, recolhidos pelo Instituto Nacional de Estatística de Portugal. Estas informações encontram-se disponíveis para consulta pública em meio eletrônico, mediante a concessão de autorização para uso das informações para fins científicos.

4 Resultados e Discussão

Os resultados e discussão da presente tese de doutoramento se estruturam em 4 artigos científicos submetidos a revistas científicas. O relato das investigações é realizado na língua inglesa. O primeiro é uma revisão da literatura que apresenta um levantamento dos estudos que empregam os dados dos inquéritos aos orçamentos familiares de Portugal como fonte de informação sobre a disponibilidade alimentar e de bebidas nos domicílios deste país. O segundo descreve a disponibilidade de alimentos, bebidas e de nutrientes selecionados nos domicílios Portugueses com idosos. O terceiro analisa a qualidade da dieta dos domicílios Portugueses com idosos comparativamente aos dos adultos com a mesma composição. A última análise descreve o efeito conjunto das variáveis sociodemográficas e do tempo na contribuição relativa dos grupos de alimentos e bebidas para o total de alimentos e bebidas disponíveis nos domicílios Portugueses com idosos.

4.1 Artigo 1: The use of Household Budget Surveys (HBS) to assess dietary data in Portugal: a review.

Submited for publication

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Abstract

This manuscript briefly summarise the documents that used the Household Budget Surveys (HBS) to assess dietary data in Portugal. A literature review was done using various resources including multidisciplinary and specialized electronic research databases and National and International official Institutions. This review analysed the historical background of the published materials between 1970 and 2012 written in Portuguese, English and Spanish. The indicators used by the manuscripts reviewed were household *per capita* daily food and beverages availability and/or expenses (expressed in absolute or relative values). Descriptive statistics followed by regression and econometric models were the analytical procedures employed. Results from the selected studies showed that Portuguese dietary pattern changed over time, moving away from the traditional Mediterranean diet. Despite the limitations, the HBS have been used to describe the dietary data in Portugal and represent an important source of this issue at national level. The use of HBS as a source of dietary data is underestimated. To overcome this gap, econometric and nutritional perspectives could be used together in order to improve the Portuguese dietary monitoring system. Furthermore, the development of scientific and academic data using Portuguese HBS data could also strengthen the analysis of dietary data in this country.

Keywords: Food and nutrient availability, dietary data, Household Budget Survey, Portugal.

Introduction

The household budget surveys (HBS) are national surveys mainly designed to gather information about income and consumption expenses. These surveys, conducted by national statistical offices, are generally multiple purpose[1,2]. They provide not only relevant economic information but also a range of reliable demographic and socio-economic characteristics and, among others, data on food and beverages purchases[3].

The HBS dietary data refers to the food and beverages availability at the household level[3], an indirect measure of dietary intake. The importance of HBS in the nutrition information system relies on its ability to describe dietary patterns[4-7], information that can be used for nutrition strategy planning, agricultural strategy planning and marketing purposes[8,9]. The regularity and comparable flow of information due to similar HBS baseline methodology[1,2] and post-harmonization of its dietary data[5,6], contributed to the use of that data source as an option for monitoring and comparing dietary habits in Europe[6,7]. In the absence of other direct dietary intake data, the HBS dietary data assume a higher importance[7,9-11]. In Portugal, national representative direct information on dietary data is scarce[12-17]. Therefore, the purpose of this study is to identify documents that describe Portuguese dietary data from the HBS in order to indicate major information gaps and areas for future research.

Methods

The search was conducted by two independent reviewers and included two consensual meetings with the other authors. The list containing the abstract of the documents obtained by the reviewers was submitted at the first consensual meeting to discuss suggestions and to reach consensus regarding the selection of the materials to be included in the review. The second consensual meeting served to exam the selected material. Subsequently, full texts were accessed and data extraction was performed using predefined criteria. Figure 1 summarizes the stages of the review process.

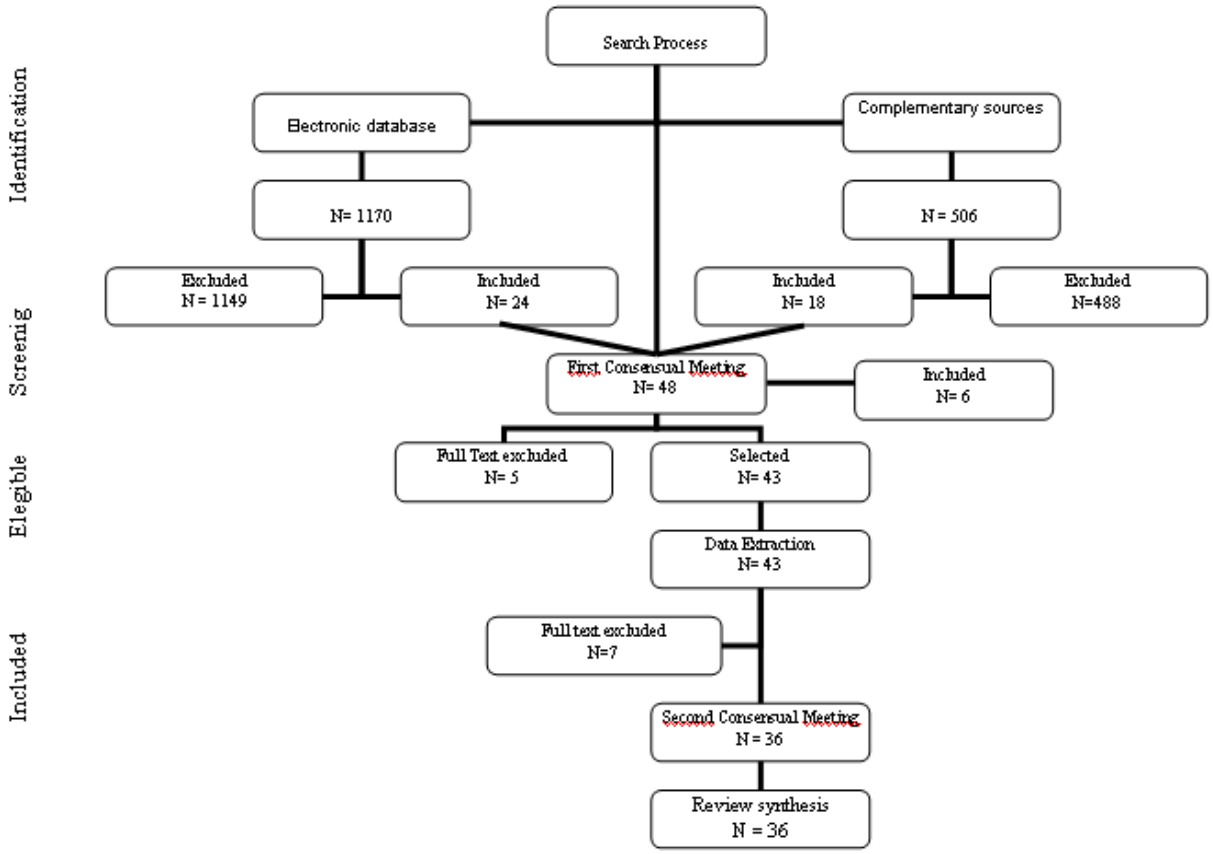

Figure 1: Phases of the review process.

Documents inclusion and exclusion criteria

The selection of the documents was based on predefined inclusion criteria. Documents published between July 1970 and July 2012, publications measuring food expenses and food and/or nutrient availability derived from HBS conducted in free-living populations in Portugal (representative samples of the population) written in Portuguese, English and Spanish were included.

Search words and sources

The explorative literature search was performed based on the research question "What are the available literature that describe Portuguese dietary data from the HBS?".

The search strategy used mesh identifiers and research words derived from the research question, adjusted to the resources; described as follows: ("Data Collection"[Mesh] AND (("Budgets"[Mesh] AND "Family"[Mesh]) OR "Housekeeping/economics"[Mesh] OR "Housekeeping/statistics and numerical data"[Mesh] OR "Family Characteristics"[Mesh])) AND ("Food Supply/statistics and numerical data"[Mesh] OR "Food Supply/economics"[Mesh] OR "Diet/economics"[Mesh] OR "Diet/statistics and numerical data"[Mesh] OR "Food/economics"[Mesh] OR "Food/statistics and numerical data"[Mesh])).

Multidisciplinary and specialized electronic databases such as SCOPUS, ISI Web of Knowledge, Scielo, PUBMED, SSRN and Soc Index were used as search engines. A range of Institutions involved in the development and/or analyses of the HBS were also considered as sources, namely: National and International Government and Statistics agencies (Instituto Nacional de Estatística - INE, Statistical office of the European Union - EUROSTAT), national open access scientific repository (Repositório científico de acesso aberto de Portugal – RCAAP) and official National and International Institutions and Organizations (Base de dados de Portugal Contemporâneo - Pordata, Organisation for Economic Co-operation and Development - OECD, Food and Agriculture organization of the United Nations and World Health Organization -FAO/WHO). Furthermore, the research groups/project (Data

Food Networking - DAFNE-ANEMOS) responsible for producing and reporting dietary data was also used as complementary source.

General characteristics of the selected documents

In total, this search identified 1,676 potential documents out of which 43 were considered eligible. Seven relevant documents were excluded[36-42] because their results were also presented and analyzed in other included materials. Therefore, 36 documents were analysed.

The reviewed documents were papers (N=22) and reports (N=14). The dietary characteristics are the main research focus of the identified materials, usually presented as articles. The reports discuss mainly methodological characteristics of the HBS2[18-31], and dietary information refers to food and beverage expenses associated with sociodemographic characteristics and econometric measures. Sekula (1991)[32] and Vassilakou & Trichopoulou (1992)33 also described methodological details of HBS from European countries, including Portugal. Furthermore, studies by Trichopoulou et al (2001 and 2005)[34,35] discuss the methodology for assessing dietary patterns across Europe using data from the HBS.

Results

The reviewed documents will be described as a summary displayed in tables 1, 2 and 3 covering methodological aspects of the Portuguese HBS as sources of dietary data, analytical procedures used to assess Portuguese dietary data from HBS and the characteristics of Portuguese dietary data from HBS.

Methodological aspects of the Portuguese HBS as sources of dietary data

In order to assess HBS raw data in Portugal, a request for consent is required according to data protection and confidentiality protocols of the "Instituto Nacional de Estatística" (INE)[2], the institution responsible for the development of these cross sectional studies.

Until now, eight surveys have been conducted, at five year intervals. The sampling procedure used a multiple-stage technique with two different units. Primary units were the second level of the Nomenclature of Units for

Table1. Methodological characteristics of Portuguese Household Budget Surveys - HBS from 1967/1968 to 2010/2011.

Survey Characteristics	HBS by Survey Years							
	1967-1968	**1973-1974**	**1980-1981**	**1989-1990**	**1994-1995**	**2000-2001**	**2005-2006**	**2010-2011**
Survey scope	Private consumption							
Coverage	Mainland Portugal	Mainland Portugal and Cities from Autonomous Regions of Azores and Madeira	Mainland Portugal, Autonomous Regions of Azores (São Miguel Island)*	Mainland Portugal and Autonomous Regions of Azores and Madeira				
Sampling frame	1960 Census	1970 Census Recont	1981 Census		1991 Census		2001 Census	
Sample Design	Multistage probabilistic method, area stratified and population based sample.							
Sampling Unit	Household				Accomodation unit			
Analytical Unit	Private household (HH) - a person or group of people sharing the accommodation and food.							
Sample size	10517	17280	10182	12403	10554	10020	10403	16815
Data Collection (m/y)	04/67-03/68	07/73-07/74	03/80-02/81	03/89-03/90	10/94-10/95	01/00-01/01	10/05-10/06	03/10-02/11*
Food availability data	Food purchase (quantity and value)		Food purchase (quantity and value including donation)					
Food Aggregation	After data collection when entering data base							Electronic recording during the collection
Number of Food and beverages groups	14	20	12		not available		12	11
Collection period	1 week				14 days			

Source: INE, 2012[2]; INE, 1970[19]; INE, 1971[19]; INE, 1972[20]; INE, 1977[21]; INE, 1985[22]; INE, 1990[23] INE, 1992[24]; INE, 1997[25,26]; INE, 2000[27]; INE, 2002[28]; INE, 2005[29]; INE, 2008[30]; INE, 2012[31].

* In Autonomous Region of Madeira and due to constraints related with natural disaster, data collection occurred between late March of 2010 and 27 March of 2011.

Table 2: Summary of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Author/Year of Publication/	Objective	Indicators assessed	Summary of Statistical/Analytical procedures
Sekula (1991)[32] EU-PT	To review HBS methodology in 17 European countries in the context of food and health data and their use in nutrition policy-making	Study purpose, coverage, sampling, periodicity, reporting period, number food items	Overview of HBS methods
Vassilakou &Trichopoulou (1992)[33] EU-PT	To assess the extent of the comparability of dietary data from HBS of eighteen European countries.	HBS methodological information (sample design, size and frame; response rate, cost of the survey); information regarding food and beverage data collection (description, number of items and form of recording in value and quantity) and information from the last HBS edition	Overview of HBS methods
Cruz (2000)[44] PT	To analyze Portuguese household consumption structure in 1989/90 and to compare over time changes and drivers (between 1989/90 and 1994/95).	Consumption structure (% of household expenses with food and other items such as dressing, health, leisure, eating out, furniture, and cars in total household expenses)	PCAa and comparison of the consumption structure (frequency)
Rodrigues & de Almeida (2001)[45] PT	To study the changes in Portuguese household food availability from 1990 up to 1995.	Mean food group availability (quantity/person/day) according residence (rural, semi-urban and urban) and educational level of the household head; % food expenditure/total household expenses; and eating out expenses (%)	Descriptive statistics (mean)
Trichopoulou et al (2001)[34] EU-PT	To characterize from DAFNE (Data Food Networking databank) the variation of food habits in Europe, around 1990.	Mean food group availability (quantity/person/day) according residence (rural, semi-urban and urban) and educational level of the household head for European Countries	Descriptive statistics (mean)

Continued Table 2: Summary of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Author/Year of Publication/ Geographical Scope	Objective	Indicators assessed	Summary of Statistical/Analytical procedures
Homem e Souza (2001)[46] PT	To analyze 1994/95 Portuguese household consumption structure and the influence of sociodemographic variables.	Consumption structure (% of household expenses with food and other items such as dressing, health, leisure, eating out, furniture, and cars in total household expenses)/sociodemografic variables	ELESb and AIDSc
Trichopoulou et al (2002)[47] EU-PT	To present differences in food habits and to evaluate dietary changes within a 10-year interval (according to socio-demographic variables) in European populations	Mean food group availability (quantity/person/day) by educational level of the household head and % food expenses in total household expenditure	Descriptive statistics (mean) and univariate ANOVA
Elmalfa & Weichselbaum, (2004)[48] EU-PT	To describe food availability at the household level in European countries (part of the European Nutrition and Health Report)	Mean food group availability (quantity/person/day) by educational level of the household head	Descriptive statistics (mean)
Trichopoulou et al (2005)[35] EU-PT	To develop a European, regularly updated databank of comparable food and socio-demographic information as a tool for monitoring trends in dietary habits in Europe.	Mean food group availability (quantity/person/day) and deviation of daily individual availability from overall average - DAFNE food availability (%)	Descriptive statistics (mean)
Rodrigues & de Almeida (2006)[49] PT	To characterize the availability of food, energy and nutrients for older people living alone.	Mean food group (quantity/person/day) and median availability of energy and nutrients	Descriptive statistics (mean and median)

Continued Table 2: Summary of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Author/Year of Publication/ Geographical Scope	Objective	Indicators assessed	Summary of Statistical/Analytical procedures
Naska et al (2006)[50] EU-PT	To describe the dietary patterns of 10 European countries and their sociodemographic determinants.	Mean food group availability (quantity/person/day) by locality (urbanization), educational level and occupation of the household head, and type of household and % deviation overall mean food availability	Descriptive statistics and PCAa
Aranceta et al (2006)[51] SP-EU	To assesses Spanish nut consumption in comparison with other European countries using different sources and levels of dietary data (country, household and individual).	Mean nut availability (quantity/person/day) weighted average based on survey year by sociodemographic characteristics	Descriptive statistics (mean)
Rodrigues et al (2007)[52] PT	To evaluate households' diet-quality trends and regional disparities, and to study the socioeconomic influences.	Mean food group availability (quantity/person/day), HDIrd and MAIe	Descriptive statistics (frequency, percentile distributions) and logistic regression
Rodrigues et al (2007)[43] PT	To compare different levels of Portuguese dietary data (country -food supply-FS, household- household budget surveys-HBS, and individual -food frequency questionnaire-FFQ) and to validate the use of the HBS derived dietary data.	Mean food group availability (quantity/person/day) and relative energy contribution (%/person/day)	Descriptive statistics (mean), Spearman Correlation coefficients and dissimilarity matrices (Euclidian distances and standardized Z-scores)
Rodrigues et al (2007)[53] EU-PT	To identify time trends and socio-demographic disparities in Portuguese food habits and to compare it with other European countries.	Mean food group availability (quantity/person/day) by sociodemografic characteristics and % deviation overall average food availability	Descriptive statistics (frequency, % differences and mean)

Continued Table 2: Summary of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Author/Year of Publication/ Geographical Scope	Objective	Indicators assessed	Summary of Statistical/Analytical procedures
Cruz (2008)[54] PT	To characterize the evolution of the household consumption structure pattern between 1967 and 2006.	Consumption structure (% of household expenses with food and other items such as dressing, health, leisure, eating out, furniture, and cars in total household expenses)/sociodemografic variables	Quantitative (frequency, PCAa) and qualitative analysis (Practice theory)
Rodrigues et al (2008)[55] PT	To investigate the association between regional household diet quality and corresponding mortality data.	Mean food group availability (quantity/person/day), HDIrd and MAIe by sociodemographic characteristics	Descriptive statistics (frequency, mean) and Pearson correlation coefficients
Pereira & Ferreria (2008)[56] EU-PT	To characterize the evolution of the household consumption structure pattern between 1991 and 2001 of some European Countries	Consumption structure (% of household expenses with food and other items such as dressing, health, leisure, eating out, furniture, and cars in total household expenses)	Double PCAa
Naska et al (2009)[57] EU-PT	To compare different levels of dietary data (country -food supply-FS and household-household budget surveys-HBS) among European countries and, to estimate the correlation between these dietary data and mortality statistics.	Mean food group availability (quantity/person/day)	Descriptive statistics (mean), Spearman Correlation coefficients and partial rank correlation coefficients
Naska et al (2010)[58] EU-PT	To evaluate time trends in the availability of soft drinks, to identify food choices associated with their consumption and to assess the relationship between socioeconomic status and soft drink availability in European countries.	Mean soft drinks and food group availability (quantity/person/day)	Descriptive statistics (mean, % differences, percentile), trend analysis , and linear and logistic regression models

Continued Table 2: Summary of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Author/Year of Publication/ Geographical Scope	Objective	Indicators assessed	Summary of Statistical/Analytical procedures
Rodrigues et al (2010)[59] PT	To present the results of the 2005 HBS dietary data according sociodemographic characteristics under the current DAFNE-ANEMOS project.	Mean food group availability (quantity/person/day)	Descriptive statistics (mean)
Cruz (2011)[60] PT	To identify Portuguese household consumption expenditure pattern and to emphasize the effect of structural constraints on consumption practices and the conditioning relationships of sociodemographic variables.	Consumption structure (% of household expenses with food and other items such as dressing, health, leisure, eating out, furniture, and cars in total household expenses)/sociodemografic variables	Quantitative (frequency) and qualitative analysis (Practice theory)

List of abbreviations:

EU- Europe; PT-Portugal; SP-Spain; HBS – Household budget surveys.

a) PCA- Principal components analysis; b) ELES – Extended Linear Expenditure System; c) AIDS -Almost Ideal Demand System; d) HDIr- revised version of the Health Diet indicator; e) MAI – adherence to Mediterranean food pattern.

Table 3: Summary of the results and conclusion of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Study	Results Portuguese data	Conclusion
Sekula (1991)[32]	Portuguese HBS estimates consumer price index, national accounts and statistics, and study household living standards. It covers nationally representative samples (three stage sample design) and is conducted at 5-6 years interval (from 1974 through 1981). One week is the reporting period and 12 food items were described according to household income and 51 food items according to household expenditure.	European HBS present similarities that may allow comparison of derived dietary data
Vassilakou &Trichopoulou (1992)[33]	Information of Portuguese HBS such as response rate (65%), sample size (16800), frame (Census), unit (dwelling), as well as specific information regarding food (e.g. number of food items included in the questionnaire – 77 recorded the value and 72 also in quantities) and other important information were compared with those from other European countries.	Summarized information revelled that HBS dietary data from European countries can be compared
Cruz (2000)[44]	Household age composition, household type and its economic situation influenced the consumption structure. Food expenses represented the largest item in the family budget and decreased over time. Older households spent more on food while younger ones spent more on eating out, reflecting their better economic situation. Consumption structure changed from "need" to "materialist".	Food expenses still dominate the household budget. Differences in the consumption structure were related with age composition of the households and cultural level, further analysis need to be done to identify if the consumption structure changes had to do with cultural change and/or by differences in the stages of family life (changes in the age composition of the household members)
Rodrigues & de Almeida (2001)[45]	Decreased the availability of most food items except of meat, fish/seafood, milk/dairy products, cheese and non-alcoholic beverages. Urban areas had higher consumption of meat, added lipids (animal) and milk/dairy products, as well as of fruits and fish/seafood. Households headed by lower educated person had higher availability of cereal/cereal products, potatoes, pulses, vegetables, added lipids (vegetable), sugar/sugar products and alcoholic beverages. Food expenses decreased over time while the eating out expenses, increased.	Decreased the availability of food products, especially those related with the Mediterranean food pattern (e.g. olive oil) while increased the availability of foods that contributed for the protein content, showing that Portugal might be moving away from the traditional 'Mediterranean diet'. Disparities in the availability of food were found between residence location and educational level of the household head.
Trichopoulou *et al* (2001)[34]	Disparities in food habits and variation within countries by residence and educational level were presented in pictorial presentations. Mediterranean countries have become important meat consumers and had substantial availability of vegetables and fresh fruits. In Portugal vegetables were mainly consumed fresh (97%).	The importance of DAFNE databank was shown by the presentation of European food disparities according geographical areas and socioeconomic characteristics.
Homem & Souza (2001)[46]	Food and beverages, tobacco, transportation and communication services were considered essential goods. Household located in the North and that had an elder person spent more on food and beverages. Lower food expenses were found in lonely elderly (0.131 %) and lonely adult (0.133 %) households.	Expenses on food and beverages presented the highest share on the household consumption structure which were most influenced by the household location and type.

Continued Table 3: Summary of the results and conclusion of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Study	Results Portuguese data	Conclusion
Trichopoulou *et al* (2002)[47]	Generally, Southern European countries had a higher availability of cereals, fish and seafood, fresh fruit and vegetables, legumes and vegetable oil (olive oil). All countries presented a sharp increase in the availability of soft drinks and over time, the availability of most food items decreased. Higher education was related with lower availability of most food items, with the exception of low-fat milk, fresh fruit, animal lipids and soft drinks. Nevertheless, higher availability of fresh fruits and vegetables were associated with lower educational level in South European countries. Only in Portugal the meat availability increased with educational level where a greater availability of fish and seafood, milk, fresh fruit, vegetable fats, animal lipids and soft drinks was also found. Household food expenses (%) were inversely correlated with income.	Disparities were found between food availability in European countries. Higher educational level was associated with lower availability of most food items. Household food expenses can be used as a proxy (indicator) of socioeconomic status.
Elmalfa & Weichselbaum, (2004)[48]	In general the food availability decreased. Southern European countries had the highest availability of fruits and vegetables and, at those countries, lower educational level of education was associated with higher availability of vegetables. Portugal had high availability of fruit, potatoes, vegetables and fish/seafood; and lower of soft drinks (38 ml/person/day).	Location and level of education influenced the differences in household food availability. The disparities were higher between south and north European countries.
Trichopoulou *et al* (2005)[35]	In Portugal the mean availability of meat was high, (varied in 150% from overall average - DAFNE food availability), and low for meat products (lower than 50% from overall average - DAFNE food availability).	The food availability data refers to harmonized information from nationally representative samples presented according sociodemographic characteristics allowing the monitoring of trends in food availability, both within and between countries as well as, the effect of sociodemographic characteristics.
Rodrigues & de Almeida (2006)[49]	Compared with the Portuguese dietary recommendation, the availability of milk/milk products, pulses, vegetables and fruits was low, while were high the availability of meat, fish, eggs, fats and oils, and sugar/sugar products in households of older people living alone. The availability of dietary energy, calcium, iron and vitamin C, B6 and B12 were below the 25th percentile. On the other hand, were high the values for energy, sodium, protein and fats and low the values for vitamin B6, at the 75th percentile.	The availability of food, energy and nutrients for older people living alone showed the disparities in their dietary profile. Despite HBS limitations, this data can be used to monitor dietary trends in specific population groups, such the elders.
Naska *et al* (2006)[50]	Mediterranean region had higher availability of vegetable oils, pulses, red meat, poultry, fish/seafood. Portugal presented the highest availability of vegetable oil (other than olive oil), red meat, poultry, potatoes and pulses and wine. Two dietary patterns were found: the 'wide-range' food buyers (more common among households of retired and elderly members) and the 'beverage and convenience' food buyers, (more common among households located in urban or semi-urban areas and among adult Scandinavians living alone).	Disparities in food availability were found between countries and regions. The difference in fruit availability between Mediterranean and Northern European countries seems to be levelling out.
Aranceta *et al* (2006)[51]	Compared to Spain, Portugal showed higher values of nut availability (weighted average of 2.33 to 3.01 g/person/day, from 1989 through 2000) and it increased over time. Increased nut availability was found between households headed by higher educated person (3.01 to 4.77 g/person/day).	Nut consumption varied according the educational level of the household head and region.

Continued Table 3: Summary of the results and conclusion of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Study	Results Portuguese data	Conclusion
Rodrigues *et al* (2007)[52]	Those households with low-quality diet were more likely to: have higher outside home food expenditures, to be located at Azores, be headed by people with higher educational level, be located at more urbanized areas and have higher income. The overall diet quality were higher for the households headed by elderly, with lower education, unemployed, composed by two elders, interviewed during the summer.	Portuguese diet quality was poor, decreased over time and varied according sociodemographic characteristics.
Rodrigues *et al* (2007)[43]	The mean availability (quantity *per capita*/day) from the HBS (household) fell below the Food Balance Sheets (national) and closer to Food Frequency Questionnaire (individual), due to known methodological differences. Higher agreement between the data were found when HBS values were expressed in relative energy contribution rather than when absolute amounts were considered.	The comparison between different levels of dietary information supported the use of HBS data as an option to assess dietary habits in Portugal.
Rodrigues *et al* (2007)[53]	Portuguese food availability for most foods decreased except for an increase in fruit and vegetable juices, non-alcoholic beverages (soft drinks, mineral water), spirits, added fats (animal), meat/meat products, fish/seafood, milk/milk products and nuts availability. Rural households presented higher availability of pulses. Households headed by higher educated person had lower availability of pulses and higher availability of added fat (animal), spirits, wine, mineral water, fruit and vegetable juices, characteristics that persisted over time. Non manual households had higher availability of added fats (animal), nuts, juices and mineral water and households with unemployed heads had higher availability of spirits, wine, fruit and vegetable juices and increased availability of meat and added fats (animal). Portugal compared to other European countries presented higher availability of cereals, pulses, fruits, potatoes, fish/seafood, fats and oils and alcoholic beverages (wine in particular), meat/meat products; lower availability of vegetables, milk/milk products, eggs, sugar and sugar products, fruit and vegetable juices, soft drinks and stimulants.	Over time decreased the food availability and were found disparities according to the sociodemographic characteristics. The dietary trends suggest a departure from the traditional Mediterranean dietary pattern.
Cruz (2008)[54]	Food, household payment and transport expenditure dominate the household budget. The expenditure in food decreased from 1967 to 2006 passing from the 1st to the second largest expense in the total household expenses. The need and taste were the determinants of the consumption structure pattern.	The consumption structure changed and was influenced by the need and taste, aspects highlighted by the sociology of taste and lifestyles.
Rodrigues *et al* (2008)[55]	Higher diet quality had significant inverse correlations with cause specific mortality rates from chronic diseases. Cancer were positively correlated with the availability of protein, cholesterol and soft drinks, but inversely correlated with polyunsaturated fatty acids. Diabetes and cardiovascular diseases mortality rates showed significant positive correlations with simple sugars and animal fat intake, but inverse with fruits and vegetables. Cardiovascular diseases also presented positive correlations with milk and dairy products and inverse for vegetable oils.	Diet quality indices from HBS dietary data were correlated with mortality causes describing the relation of diet and disease occurrence.
Pereira & Ferreria (2008)[56]	The Portuguese household consumption expenditure in food and beverages and clothing and footwear decreased in proportion to total household consumption expenditure. Portugal and Italy had the highest values for expenses in food and beverages but the values decreased over time.	Decreasing trend on food expenses was found. Southern European countries spent more than Northern European ones to buy food. The decrease in expenses of essential goods related with the improvement of living conditions.

Continued Table 3: Summary of the results and conclusion of the reviewed documents selected through literature search of Portuguese household budget surveys (HBS) as a source of dietary data.

Study	Results Portuguese data	Conclusion
Naska *et al* (2009)[57]	Data from HBS and Food Balance Sheets (FBS) had high correlation, ranging from 0.93 for olive oil up to the lower values of 0.39 found for meat/meat products. The FBS and the HBS estimates for the availability of vegetables, fruits, fish and seafood, as well as for olive oil were inversely associated with the indicators of mortality.	Diet characteristics from FBS and HBS dietary data were correlated with mortality causes describing that these source of dietary data can be used to complement dietary assessment at population level.
Naska *et al* (2010)[58]	The availability of soft drinks increased, in Portugal by 23% *per* year. European countries had disparities in the availability of soft drinks and it was correlated with lower availability of vegetables and fruits and milk and higher availability of meat and sugar products. Lower socio-economic status was correlated with increased availability of soft drinks.	Soft-drink availability showed disparities according to socio-economic characteristics and European regions. The increase of soft drink availability was associated with unfavourable diet choices.
Rodrigues *et al* (2010)[59]	The daily availability of most food groups decreased. However, increased the availability of non-alcoholic beverages, nuts, milk and milk products and especially of fruit and vegetable juices. Locality of the household, education of the household head, occupation of the head of the household and composition of the household were related to disparities in household food availability. e.g.: households located in more urbanized locations had lower availability of cereals, potatoes, pulses, vegetables, nuts, total added lipids, sugar/sugar products and alcoholic beverages and higher availability of fruit, milk/ milk products, non-alcoholic beverages and fruit and vegetable juices, and households headed by higher educated people had higher availability of fruit and vegetable juices, milk/milk products, fruits, nuts and lower availability of meat/meat products, added lipids, alcoholic beverages and sugar/sugar products. Compared to other European countries Portugal had the lowest availability of added lipids, sugar and sugar products, non alcoholic beverages and fruit and vegetable juices. Despite the decrease of the availability of alcoholic beverages, Portugal remains among the European countries with highest availability of this item.	Portuguese dietary patterns changed and the household availability of most foods decreased, influenced by sociodemographic characteristics.
Cruz (2011)[60]	A decrease in the importance of the food expenses in the household budget was found. At the same time, this emphasized the strong traditionalist structure of the family budget, dominated by taste or necessity as income alone does not explain the structure of the family budget. Consumption was explained by socioeconomic aspects but also by the concept of living standards. Purchasing power and cultural values were the empirical evidence found.	The consumption structure changed and was influenced by the need and taste, aspects highlighted by the sociology of taste and lifestyles.

List of Abbreviations:

DAFNE – Data Food Networking databank.

Territorial Statistics (NUTS 2), and secondary units were the households in each area, according to census data[2,18-23,25,27,29,31]. The aims of these studies have been to estimate income distribution indicators, level and structure of expenditures as well as the population wellbeing level. Such surveys are nationally representative and regularly have been collected through interviews and a self-registration diary to record income sources and expenses (description of the item acquired, quantity and monetary value). The latest HBS survey from 2010/201131 included electronic recording. Table 1 shows a summary of the methodological characteristics of the Portuguese HBS.

Over the years, changes in the scope of the study, the definition of the variables of interest as well as in the methods to access the dietary data in households were introduced. However, such changes did not affect comparability from 1990 onwards. The dietary data are defined as food and beverages purchased, home produced, or received as gifts[18-31]. The collection of food and beverages availability was made throughout the year to include seasonal variation, during seven days until 1989/1990 and fourteen days from the 1994/1995 version onwards. The information about outside-home food expenses included the description of a limited number of food items, classified in monetary values and quantities. Thus it do not allow a clear description of outside home food intake.

Analytical procedures used to assess Portuguese dietary data from HBS

Table 2 presents a summary of the reviewed documents[32-35,42-60] presenting Portuguese household budget surveys (HBS) as a source of dietary data, complementing the information from INE reports19,32, presented in table 1.

More detailed information about Portuguese food and nutrient availability has been accessible since 2000. The study of Rodrigues & Almeida (2001)[45], was the first to specifically present Portuguese HBS dietary data. The results opened the discussion on this topic as a consequence of the use of the post harmonization procedure developed by DAFNE-ANEMOS project[5,6,35,61]. The recommended analytical procedure included the description of food groups and sociodemographic characteristics.

The food and beverage items are coded according to Classification of Individual Consumption According to Purpose (COICOP) description, expressed in food quantities and food expenses. Portuguese household food availability data were recorded in approximately 500 different codes and categorized into 15 main food and beverages groups according to the DAFNE procedures and its food classification scheme[5,6,35,61]. Portuguese dietary data follow DAFNE classification scheme and the main food groups most used to present Portuguese data are: cereals (cereal and cereal products), meat/meat products (meat, meat products, and dishes), fish/seafood, eggs, milk/milk products, added fats/oils, potatoes (potatoes and other starchy roots), pulses, nuts, vegetables, fruits, sugar/sugar products, non-alcoholic beverages (stimulants – coffee, tea, and cocoa, bottled water, fruit/vegetable juices, and soft drinks) and alcoholic beverages (wine, beer, and spirits). The several sociodemographic characteristics harmonized in the context of the DAFNE-ANEMOS[5,6,35,61] project included locality (rural, semi-urban and urban); education of the household head (elementary, secondary and higher education); occupation of the household head (manual, non-manual, retired, unemployed and other); household composition type (1 adult, 2 adults, 1 adult with children, adults with children, adults with elderly, adults with children and elderly, 1 elderly, 2 elderly, other). Studies analysing only Portuguese data[45,52,59] also reported region according NUT2 (North, Central, Lisbon and Tejo Valley, Alentejo, Algarve, Azores, and Madeira).

Previously to DAFNE-ANEMOS, the main study focus of the Portuguese HBS dietary data was food and beverages expenses described according sociodemographic characteristics and proportion of total expenses[18-22,24,26,28,30,31,44,46,54,56,60].

The analytical procedures used by the reviewed documents included the overview of HBS methodological issues interesting for the analyses of dietary data[32,33], as well as, conformity with HBS dietary measures with other levels of assessment of dietary information[4,57]. Besides this approach, the HBS dietary data were mostly treated through descriptive statistics[34,35,45,48,49,51,53,59] and the analysis included mostly data from the

entire Portuguese population and comparison with data from other European countries. Only one study compared a particular population group, the lonely elderly households with lonely adult ones[49].

Although the production of descriptive estimates remains the main form of analysis of those surveys[10], there is an increasing use of more complex analytic techniques such as, logistic regression models. These regression models have been used to investigate the association of dietary data with sociodemographic characteristics[52,58]. The demand analysis[52], of the econometric analytical procedures, was another complex modelling approach used. Furthermore, dietary pattern were also analyzed using a priori approach[52,55] and the data-driven methods [50,57].

The description of dietary characteristics was made mainly by the mean food availability (quantity/person/day). Its estimation was mainly based on simple means obtained through the division of total amount of food and beverages divided by the total number of household members. The computation of the food and beverages taking into account the size of the household, as well as, the gender and the age composition of the household members were addressed by Naska et al (2006)[50], which results included Portuguese data from 1990. The description of dietary energy, nutrient and macronutrient contribution to the total energy available at the household level were also presented in other documents[43,49]. Furthermore, the determinants of the dietary changes have been evaluated through HBS dietary data focusing on food availability, diet quality and expenses on food. Expenditure on food was also discussed as an econometric measure[44,46,54,56,60].

Characteristics of Portuguese dietary data from HBS

Table 3 summarizes the results of the reviewed documents. The results revealed that Portuguese dietary patterns changed and that the daily per person household availability of most food groups decreased[47-49].

The availability of alcoholic beverages, cereals, fats/oils, potatoes, and sugar/sugar products fell over time in Portuguese households. Inversely, the availability of meat, milk and milk products, fruits and non-alcoholic beverages increased[34,48]. However, the 2005 HBS data[59] revealed that the

availability of meat/meat products and dishes and fish decreased reaching practically the same values as in 1990. A significant increase in the availability of soft drinks[47,58] and nuts[51] between 1990 and 2000 was also reported. Despite the reduction of the availability of alcoholic beverages, Portugal still remains among those European countries with the highest availability of this item[53,59] at the last analysed period (2005).

Sociodemographic characteristics have been reported as important determinants for dietary availability. High availability of meat[34,35,45] was associated with higher educational level47, and location of the household in urban areas[47]. However, in 2005, a reduction in meat availability was noticeable among those with higher educational level59. Furthermore, the availability of meat was above the average compared to other European countries[50,59].

Diet quality was poor and decreased over time according to the revised version of the Healthy Diet indicator and adherence to Mediterranean food pattern indexes[52]. Those households located in the Azores, in semi-urban and urban areas, with higher socioeconomic status (whose head had higher education, higher income and higher outside home food expenses) presented the lowest levels of diet quality[52]. The dietary trends suggest a departure from the Mediterranean dietary pattern[53,59]. Furthermore, results from Rodrigues et al (2008)[55] found that higher diet quality was inversely associated with mortality rates from chronic diseases. Additionally, fruits and vegetables availability as well as polyunsaturated fatty acids had, respectively, inverse correlation with mortality rate from cancer and diabetes. Similar results were found by another study[57] analysing the association of mortality rates with dietary estimates from HBS derived data and from food balance sheets. Their results showed that the availability of vegetables, fruits, fish and seafood, as well as for olive oil, were inversely associated with the indicators of mortality from chronic diseases.

The food and beverages expenses dominate Portuguese household's budget and these items were considered as essential needs[44,46,54,56]. Nevertheless, over the years, the relative importance of household food expenses

decreased[30,44,46,54,56,60] while outside home food expenses increased. Fators such as age of household members, household type and the economic situation were reported as fators that influenced the Portuguese household food expenses. Sociological analyses revealed that need and taste, mediated by cultural practices and social values, were determinants of the household expenditure structure[54,60].

Discussion

Methodological aspects of the Portuguese HBS as sources of dietary data

The need to consider methodological aspects when using the HBS as a source of dietary data was recommended by the European office of WHO in a document discussing food and health data4 and more recently by other initiatives[9-11]. The gaps on providing critical assessment of the HBS data such as database characteristics composed some of the essential information addressed when the intention is to use the HBS as part of the nutritional information system. The techniques used in the collection of the data, the number of food items recorded and their definitions and the period covered are central to dietary research in order to use food availability information more properly, especially when the interest is the estimation of the nutrient content from food purchased data[35]. The complex sample designs, common procedure in the HBS, including multistage sampling, require the use of weighting adjustments in order to reflect the assumptions made in the study design[10,35, 62].

The HBS dietary (food and nutrient) derived data present some limitations. It does not specify quality or quantity of: food items consumed outside the household; food losses and waste; food given to pets; meals offered to guests; uses of supplements; and the presence of pregnant or lactating women in the household. The household food availability represents a gross and indirect measure of dietary intake once the amount of food is divided by the total number of household members[40]. However, comparisons of food and nutrient data derived from distinct sources of dietary data, namely the national food supply, household food availability from HBS and individual food consumption,

showed agreement, indicating that the use of HBS-derived data is a valid option in the indirect assessment of Portuguese43 and European food patterns[34,57]. Despite the limitations, dietary data from HBS has been collected worldwide with similar methodologies and have been referred as valuable tools for indirect measure of food intake[7,10].

The periodicity in which HBS are carried out makes them sustainable and low cost sources to assess the indirect consumption of food and nutrients, which allows HBS dietary data to complement or substitute the information from food consumption surveys, especially in the absence of direct measures.

Analytical procedures used to assess Portuguese dietary data from HBS

The most common analytical procedure used in HBS dietary data are descriptive statistics. Indeed, considering that household budget survey data are aggregated, the use of more complex modelling approaches[10] have been recommended, such as semiparametric model requiring non-linear estimation and a non-parametric model with linear weighted estimation also used to estimate age-gender specific food availability[63].

HBS dietary data were also used in a relatively straightforward logical manner in terms of the description of dietary pattern, expressed as many dietary fators jointly assessed, synthesized as a single exposure. The definition of a dietary pattern commonly uses two main approaches: *a priori* and a posteriori procedures[64]. In addition, as addressed by Wirfalt et al[64], the use of statistical technique of principal component analysis or fator analysis for variable reduction, have different proposes for nutritional epidemiology and social science. In nutritional epidemiology this methods aims to contrast linear combination of food intakes, which explain a high proportion of the variation in food intake[65]; whilst in social science these methods are used for data reduction and theory building, issues addressed in Portuguese HBS dietary derived data[44,54,60]. Although differences according to the study focus exist, the interest is to express joint aspects as a reduced or combined measure.

The regression models were also used as an exploratory tool to investigate patterns in the data intercorrelations[52,58]. One of the main advantages of using multiple regression techniques is because it allows the analysis of

several explanatory (predictor) variables along with the main outcome variable; another benefit is that advanced statistical technique attempt the multivariate nature of the household budget surveys.

In the light of the description of food items and its nutritional content, it is important to address information about the food code identification and grouping. The importance of this can be seen in food coding which is presented in an aggregated form[4,61]. This issue might have been a major concern mainly for Portuguese HBS dietary data before 1990 period when the dietary data became more detailed and included the description of more than 500 food items aggregated in a food classification system[5,6,61]. The estimation of the average daily food availability for individuals represents the main dietary information derived from the HBS data. In addition, it is important to mention that the relative contribution of each food group or nutrient to the total household availability of energy has been considered one of the best ways to describe family dietary pattern[43,66] as the HBS dietary data does not allow for direct individual estimates.

Characteristics of Portuguese dietary data from HBS

The dietary changes found by HBS dietary data are in line with those observed for food availability measured by food balance sheets67 and by direct dietary measure of representative samples of Portuguese population through three cross-sectional studies (1987, 1995-1996 and 1998-1999)[15]. Other Portuguese studies[68-72], using direct dietary measure also reported high intake of alcohol, and this condition were recognized as an important public health problem[68]. Furthermore, considering the fish intake, a study assessing direct food intake data in a sample of Portuguese population showed that, overall, the consumption of this item decreased, especially from those aged under 65 years[15]. Regarding fruit availability, Portugal presented the highest availability of fresh fruits when compared with other European countries[34,48] but it seems that the difference in fruit availability between Mediterranean (including Portugal) and Northern European countries is narrowing[50].

Nutrient estimations, based on HBS data, have been also calculated in European countries[74], as well as a description of the dietary pattern and

association with sociodemographic characteristics[34,35,47,48,50]. For example, although the dietary characteristics described for the Mediterranean region revealed higher availability of olive oil, Portugal presented the highest availability of vegetable oil other than olive oil[50]. Higher availability of meat in Portugal was associated with higher educational level[45,47], issue also addressed by studies using direct dietary measures[71, 72]. Furthermore, higher educational level was associated with higher intake[72] and availability[45] of fruit, vegetables, milk and fish. Urban location of the household and higher socio-economic status were correlated with lower quality diet[52].

The HBS derived data can address how the underlying social determinants are associated with the dietary characteristics, in terms of the prevalence of dietary characteristics according the presence or absence (or level) of sociodemographic variables. That occurs because the type of study, cross-sectional, does not allow the determination of temporal sequence of cause and effect. But descriptions and identification of possible causal associations between variables can be made. Cruz (2011)[60] indicated that the consumption was explained by not only purchasing power (income) but also by the cultural value of the product and the choice of the consumer. The high availability of alcohol between those with lower educational level and the high availability of meat between those with higher educational level can highlight cultural values and purchasing power.

Doubtless the Portuguese dietary pattern seems to be worsening, as shown by the assessment of the low adherence to the Mediterranean food pattern and compliance with WHO population dietary goals[52]. The lowering of the availability of food items such as vegetables and pulses combined with the increase of meat availability may have contributed to the worsening of the dietary profile. Furthermore, the results associating HBS dietary data with mortality[55,57] were similar to those from an explorative review[64]. Their results from the review showed that diets with abundance of plant foods, fish, and seafood, preferably including vegetable oils, and low diary products were associated with lower mortality risk of most chronic diseases.

The decrease in the importance of food expenses to total household expenditure[30,31, 44,46,54,56,60] reflects the improvement in living conditions in Portugal as this indicator can be used as a *proxy* of socioeconomic status[47]. We also found an increase of the outside home food expenses[53,59] which may lead to a poor dietary quality[75].

Conclusions

The documents identified by this review showed that Portuguese dietary data from the HBS have been used to describe the country dietary profile. The ongoing Portuguese dietary changes suggest an unbalanced diet and a deviation from the traditional Mediterranean dietary pattern[35,45,59,53], situation linked to several chronic diseases and their consequences[76,77].

Although dietary characteristics have been examined in this country, existing data on this topic are still limited. This situation calls for more initiatives to describe and monitor of the dietary situation as the first step to find evidence based solutions. Regarding this, the use of HBS dietary derived data could be reinforced. This implies an efficient application of the existing data as well as cross-sectoral work developed by cooperative actions[10,11,78] and integrated strategies addressing attention to the social determinants of health and nutritional conditions[78]. These efforts have been made and initiatives of strengthening information systems that enhance the interaction of databases are in place, but still there is room for more action.

The major information gap in the use of HBS dietary data relies on the underestimation of their analytical possibilities. Some of the limitations of HBS dietary data could be overcome by the implementation of an additional topic to the original survey (e.g. combined direct dietary intake measure in a sub sample of the population), expand the use of more complex analysis (in order to allow a better understanding of combined aspects) and/or development of analysis combining complementary study focus, such as econometric and dietary perspectives[79]. Another alternative is to specifically analyse population groups, such as the elderly.

These proposals relate to the fact that most household survey data can be used in a wide variety of ways to shed light on the topic of interest, according to the focus of the research. Considering that, the data analysis can range from analyses encompassing very simple summary statistics to extremely complex multivariate analyses. Although complex analytical methods have been used to analyse Portuguese data, some of these procedures have been discussed and instructions were made to provide and to present them in a simple way, strategy addressed for Household Sample Surveys in Developing and Transition Countries[10] that can be more used with Portuguese data. Development of scientific and academic works using the Portuguese HBS data could also reinforce the knowledge of HBS dietary data. Only two thesis using HBS data[41,42] were found.

Besides the limitations, dietary HBS data provide a wealth of information that can be used to understand the nature of dietary pattern as well as the likely effects of government intervention policies on the identified characteristic. Of course, specific programmes to assist those with poor dietary quality must be located taking into consideration their characteristics. In view of that, the use of dietary information can help policy design, once it identifies the characteristics and behaviour of the population. For example, the design of macroeconomic policies, such as the decision of overall level of taxation and government spending on food, could be addressed by results from HBS data. Another possible use could be on the definition of the type of public services and infrastructure to give assistance to the most affected by dietary inadequacy. The design of the food group to be addressed in communication campaigns and the condition do to that could also be addressed based on the dietary results of HBS derived data.

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4.2 Artigo 2: Dietary availability in elderly Portuguese households.

Submited for publication

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Abstract

Objective: To identify dietary availability and its time trends in elderly Portuguese households.

Design: A set of four cross-sectional studies based on the Household Budget Surveys (HBS) was used. The dietary data were described using the daily *per capita* availability of food and beverages, energy, and selected nutrients (macronutrients, differentiation of lipid fractions, and simple sugars). Differences between elderly household types and time trends were studied.

Setting: Portuguese HBS data from 1989-1990, 1994-1995, 2000-2001 and 2005-2006.

Subjects: Households with members aged ≥ 65 years were selected and categorized as *solitary elderly female*, *solitary elderly male,* or *couple* (composed of one elderly female and one elderly male).

Results: While *cereals*, *fats/oils*, *potatoes*, and *sugar/sugar products* have decreased, an increase occurred in *milk/milk products, fruits, bottled water, fruit/vegetable juices*, and *soft drinks* (P<0.05). The highest values for food and beverage were mostly found in *couple*, while the lowest ones were from *solitary male*. Exceptions were observed for *cereals, eggs, milk/milk products, vegetables, fruits*, and *non-alcoholic beverages*, superior in *solitary female*; and for *sugar/sugar products and alcoholic beverages*, higher in *solitary male*. Over time, total *energy* and *carbohydrates* decreased while *proteins* and *saturated fatty acids* increased (P<0.001). *Lipids* increased in

solitary male and *couple* (P<0.05). *Simple sugars* increased in *solitary male* but decreased in *solitary female* and *couple* (P<0.05).
Conclusions: The increase of *fruits* and *vegetables* in *solitary female* accords with a healthier food pattern, but overall imbalances in the macronutrient profile for all elderly households may imply a decreasing diet quality.

Keywords: dietary availability, elderly, Household Budget Survey, Portugal.

Introduction

Throughout the world, populations are aging1. In 2010, people aged 65 and over constituted 17.4% of the total population in Europe, a proportion that is expected to continue to increase in the coming decades[1,2]. The Portuguese population faces a similar trend. Demographic projections for Portugal estimate that in 2050, the elderly will represent 32% of the entire population[3].

This unprecedented situation has prompted researchers to study the relationships between modifiable fators namely, physical activity and diet because these fators are related to the development of chronic diseases and healthy aging4-6. Due to its potential to modulate the transition from vulnerability to frailty and dependence, nutrition is an important determinant of the quality of aging[6,7]. Examination and monitoring of the dietary characteristics of the elderly is important in identifying subgroups at risk of malnutrition or disease[8,9,10]. Given the need to incorporate a life course perspective11 into public health nutrition initiatives, identification of the dietary habits of elderly individuals contributes to the development of more specific and practical nutrition programs and directed interventions.

At the country level, national health surveys, food balance sheets, and household budget surveys are the main sources of data that provide direct and indirect information on dietary intake. In Portugal, national studies evaluating direct dietary intake data are scarce[12-16]. Several papers have used indirect dietary data from the Household Budget Surveys (HBS)[17,18] to examine household food availability and diet quality in Portugal, including their characteristics and time trends[19-23]. Using the same approach, the association between different localities, household diet quality, and mortality data has also been studied[23,24].

Although the HBS are not designed for dietary assessment, a comparison of food and nutrient availability based on the results of the HBS with dietary data values measured at different levels of dietary intake assessment present similar estimates[25-26]. Furthermore, HBS are collected periodically and allow the study of the effect of socioeconomic and demographic characteristics on daily food choices[20].

Although dietary characterization has previously been examined in Portugal, existing data on this topic are limited. If we consider the elderly population, the available information is even scarcer and more fragmented[27,28]. Food availability has been reported for elderly people from European countries, including Portugal, in the DAFNE-ANEMOS Project[20]. Diet quality has also been studied for European elderly households[29] and for Portuguese elders[28]. However, only one study has specified the household availability of food, energy, and nutrients for older adults, and it focused on Portuguese elderly individuals living alone in the year 2000[30].

Therefore, the purpose of this study was to identify dietary availability and its time trends in elderly Portuguese households with respect to food and beverages groups, energy, and selected nutrients.

Methodology

Study design and subjects

This study used the last four available editions of the Portuguese Household Budget Surveys (HBS), which cover representative samples of the population. The National Institute of Statistics (INE) is responsible for these cross-sectional surveys, which included 12,403 households in 1989/1990, 10,554 households in 1994/1995, 10,020 households in 2000/2001, and 10,403 households in 2005/2006. The sampling was performed through a multiple-stage technique. Primary units were the second level of the Nomenclature of Units for Territorial Statistics (NUTS 2), and secondary units were the households in each area, according to census data[31-34].

The households included in this analysis were selected and categorized according to age (≥ 65 years)[35], sex, and number of members, as follows: *solitary elderly female* households; *solitary elderly male* households; and *couple* households, composed of one elderly female and one elderly male. Households with two males or two females or more than three elders were not included due to their small sample size. Our sample comprised 1,967 households in 1989/1990, 2,219 households in 1994/1995, 2,533 households in 2000/2001, and 2,441 households in 2005/2006.

Sociodemographic variables

Sociodemographic characteristics were considered in terms of several variables. The educational level of the household head was categorized as *illiterate/elementary* for no formal education to six years of formal education, *secondary* from nine to 12 years of formal education, and *higher,* indicating a bachelor's degree, master's degree, or PhD. The household locality urbanization degree was described as *rural*, *semi-urban,* or *urban*. The locations of the households in Portuguese regions were defined according to NUTS 2: *North*, *Central*, *Lisbon and Tejo Valley*, *Alentejo*, *Algarve*, *Azores,* and *Madeira*. Economic welfare was identified by the *per capita income* (Euro/*per capita*/*per* day), the *total food expenses*, expressed as a proportion of total household expenditure (%), and *eating out expenses,* expressed as a proportion of total food expenses (%).

Dietary estimates

The HBS food and beverage acquisition information (in terms of both quantity and monetary value) were obtained through a self-registration diary of the items entering the household (purchased, home produced, or received as gifts) during seven days in 1989/1990 and fourteen days from the 1994/1995 version onward. The data were collected during a 12-month period to capture seasonal variability. Detailed methodological information about the surveys is described elsewhere[31-34].

The household food availability data were recorded in approximately 500 different codes and categorized into food and beverages groups according to the DAFNE procedures[17] and its food classification scheme[18]. A slight deviation from this classification was introduced: *fruit/vegetable juices* were described separately as well as under the main group of *non-alcoholic beverages*[36]. The mean *per capita* dietary availability was estimated through the division of the household daily availability by the household size. The fourteen main food groups used were described as follows: *cereals* (cereal and cereal products), *meat/meat products* (meat, meat products, and dishes), *fish/seafood*, *eggs*, *milk/milk products*, *added fats/oils*, *potatoes* (potatoes and other starchy roots), *pulses*, *nuts*, *vegetables*, *fruits*, *sugar/sugar products*, *non-alcoholic*

beverages (*stimulants* – coffee, tea, and cocoa, *bottled water, fruit/vegetable juices, and soft drinks*) and *alcoholic beverages* (*wine*, *beer*, and *spirits*).

The average daily *energy* (kJ/person/day) and nutrient availability (in weight or proportion of total energy available at the household), namely *proteins*, *lipids*, lipid fractions (monounsaturated fatty acids (*MUFA*), saturated fatty acids (*SFA*), and polyunsaturated fatty acids (*PUFA*), *cholesterol*), *carbohydrates*, and *simple sugars* proportions were estimated. The software MicrodietPlus for Windows Version 1.1 2000, based on McCance and Widdowson's food composition table and its updated supplements adapted to include Portuguese foods[37] was used.

Statistical methods

Weights were used to take into account the sample design effect. Descriptive statistics included mean, standard error, median, quartiles, and frequencies. For the 2005 dataset, differences between household types were studied using Kruskal-Wallis and chi-square tests. To study time trends, we used the Spearman correlation coefficient computed between the survey year and each variable. All reported p-values were two-sided and were considered statistically significant at the 0.05 level. The statistical analysis was performed in IBM SPSS Statistics version 20.0.

Results

The participants' sociodemographic descriptions are shown in table 1. The most frequent elderly household types were those composed of *couples* and *solitary female elderly* individuals. The majority of the elderly households were headed by subjects with an *illiterate/elementary* level of education, but over time, their educational level increased (P<0.001). Approximately half of the elderly households were located in *urban* areas, and this proportion increased over time, with a consequent decrease in households in *semi-urban* and *rural* areas (P<0.001). Elderly households were mainly concentrated in the *Lisbon and Tejo Valley, North,* and *Central* regions. The household *per capita income* was highest in the *solitary male elderly* household type (P<0.001) and, over time, it increased for all elderly household types (P<0.001). The *total*

Table 1 – Sociodemographic characteristics of elderly Portuguese households. Household Budget Surveys from 1990 to 2005.

Sociodemographic Characteristics	Household Types											
	Solitary elderly female				*Solitary elderly male*				*Couple* (1 elderly female and 1 elderly male)			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Sample Size	744	824	1,027	913	204	242	296	281	1,019	1,153	1,210	1,247
Education of the household head (%)												
Illiterate/Elementary	96.7	92.4	91.0	90.9	91.8	93.3	95.0	88.0	92.1	91.8	87.8	89.3
Secondary	2.2	5.2	5.0	6.6	6.3	3.1	3.8	7.2	6.0	6.8	9.0	7.4
Higher	1.1	2.4	4.0	2.5	1.9	3.6	1.3	4.8	1.9	1.4	3.2	3.4
ρ (*P*) [a]		0.073 (<0.05)				0.058 (0.118)				0.043 (<0.05)		
Locality urbanization degree (%) *												
Urban	48.8	54.8	48.0	66.1	42.3	37.1	49.4	58.8	45.3	44.3	44.8	60.5
Semi-Urban	18.3	22.9	25.8	12.6	23.6	32.1	26.6	18.0	20.4	27.4	26.7	14.0
Rural	32.9	22.3	26.3	21.3	34.1	30.8	24.1	23.2	34.3	28.3	28.5	25.5
ρ (*P*) [a]		-0.106 (<0.05)				-0.195 (<0.05)				-0.071 (<0.05)		
Portuguese Regions (%)												
Mainland Portugal												
North	28.1	27.2	26.3	28.6	32.5	24.6	24.5	26.4	27.0	30.4	29.4	27.5
Central	20.4	18.3	21.2	24.8	23.9	28.6	16.2	26.4	21.4	21.2	20.8	29.0
Lisbon and Tejo Valley	32.6	40.1	38.0	29.2	27.8	29.5	37.8	29.2	33.3	34.2	34.5	24.6
Alentejo	8.7	6.1	7.1	10.4	6.2	10.3	10.4	9.6	9.4	7.3	7.8	11.9
Algarve	6.1	4.0	4.3	4.4	6.2	4.0	8.3	6.4	6.2	4.4	4.9	4.8
Autonomous regions												
Azores	2.0	1.6	1.5	1.4	1.9	1.8	1.2	1.2	1.5	1.5	1.2	1.1
Madeira	2.0	2.7	1.8	1.3	1.4	1.3	1.7	0.8	1.2	1.0	1.3	1.0
Per Capita Income (in Euros *per day*) **												
Percentile 25	2.8	6.2	6.6	13.8	3.1	6.0	7.5	16.7	2.7	5.4	6.1	12.0
Mean	4.9	12.2	12.6	23.6	7.1	13.0	15.7	32.1	4.9	9.7	11.8	20.9
SE	0.1	0.4	0.4	0.6	0.6	0.9	0.9	1.9	0.1	0.2	0.2	0.4
Median	4.2	8.9	9.8	18.7	4.5	8.7	10.1	23.9	3.6	7.4	8.1	15.9
Percentile 75	6.2	13.3	12.7	26.8	7.5	14.0	19.1	35.0	5.7	11.2	12.7	23.8
ρ (*P*) [a]		0.669 (<0.05)				0.672 (<0.05)				0.673 (<0.05)		
Total Food Expenses (% of total household expenses) **												
Percentile 25	39.7	24.0	21.3	16.4	42.1	30.7	29.1	22.4	37.8	29.4	25.8	20.3
Mean	52.9	40.2	36.4	29.1	56.4	50.5	44.3	35.3	51.6	43.3	39.2	30.6
SE	0.7	0.7	0.6	0.6	1.4	1.6	1.4	1.1	0.4	0.4	0.4	0.3
Median	52.4	38.8	33.7	26.1	56.3	51.9	48.1	33.3	52.5	42.7	36.9	28.3
Percentile 75	67.2	54.4	48.3	39.0	72.7	69.8	59.5	47.1	64.6	55.7	50.1	38.7
ρ (*P*) [a]		-0.380 (<0.05)				-0.380 (<0.05)				-0.400 (<0.05)		
Eating Out Expenses (% of total food expenses) **												
Percentile 25	0.0	0.0	0.0	0.0	0.0	0.0	4.8	10.3	0.0	0.0	0.0	0.0
Mean	16.8	14.1	17.0	22.3	27.8	23.4	38.2	48.8	7.7	9.2	11.7	15.2
SE	1.0	0.9	0.9	1.1	2.3	2.2	2.2	2.4	0.3	0.4	0.4	0.5
Median	0.0	0.0	0.0	2.9	11.6	2.1	30.1	54.2	0.0	0.0	0.7	4.8
Percentile 75	29.4	18.8	22.4	37.6	54.0	43.7	68.9	83.3	6.7	11.6	14.4	23.0

[a] Spearman's correlation coefficient was used to evaluate time trends; * Significant differences between household types for 2005 (chi-square test $P<0.05$); ** Significant differences between household types for 2005 (Kruskal-Wallis test $P<0.05$).

food expenses impacted the budget for all elderly household types, but for *solitary male elderly* households, it presented the highest percentages (*P*<0.001). Overall, the proportion of *total food expenses* decreased over time (*P*<0.001). In contrast, *eating out expenses* for all elderly household types were low and increased over time (*P*<0.001). The *solitary elderly male* households had the highest *eating out expenses* (*P*<0.001).

Table 2 presents the *per capita* availability of food and beverage groups among elderly Portuguese household types according to survey year. Among all household types, a significant decreasing pattern was observed for *cereals, added fats/oils, potatoes, and sugar/sugar products* (*P*<0.05). An increase occurred in the availability of *milk/milk products, fruits, bottled water, fruit/vegetable juices*, and *soft drinks* (*P*<0.05). Only the *coupled elderly* household type displayed a decrease in the availability of *eggs* and *pulses* (*P*<0.001) and an increase in *fish/seafood* and *beer* (*P*<0.001). *Nuts*, *non-alcoholic beverages*, and *spirits* increased for *couples* and *solitary elderly female* household types (*P*<0.05). *Stimulants* only significantly decreased for *solitary female elderly* individuals, whereas *vegetables* increased in this group (*P*<0.05). *Alcoholic beverages* and *wine* decreased significantly in the *solitary elderly male* and *couple* household types (*P*<0.001). When comparing the 2005 food and beverage per capita availability, we found significant differences among the household types for all food and beverage groups (*P*<0.001). The *couple* household type showed the highest values for nine groups: *meat, fish, added fats/oils, potatoes, pulses, nuts, soft drinks, wine,* and *spirits* (*P* <0.001). In the remaining food and beverage groups, the values for *couples* were between the values for female and male elderly individuals (*P* <0.001). The *solitary female elderly* households had the highest values for the availability of *cereals, eggs, milk/milk products, vegetables, fruits*, and *non-alcoholic beverages* (*stimulants, bottled water*, and *fruit/vegetable juices*) (*P*<0.001). The lowest values were observed among male elderly individuals for all groups except for *pulses, wine, spirits (whose values were smallest among female elders), sugar/sugar products*, *alcoholic beverages, and beer (whose values were highest among male elders)* (*P*<0.001). The *solitary*

Table 2: Food and beverage availability (*per capita*/day) in elderly Portuguese households. Household Budget Surveys from 1990 to 2005.

Food and beverage	Household Types											
	Solitary elderly female				*Solitary elderly male*				*Couple* (1 elderly female and 1 elderly male))			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Cereals (g)												
Mean*	357.5	327.8	320.5	289.1	413.3	357.7	311.3	223.7	351.6	309.8	298.2	269.8
SE	9.6	7.3	7.2	7.8	21.9	16.6	16.4	11.6	4.9	3.2	3.9	3.9
ρ (p)[a]		-0.107 (<0.05)				-0.279 (<0.05)				-0.170 (<0.05)		
Meat/meat products (g)												
Mean*	124.1	155.9	149.4	143.6	95.4	143.4	128.3	95.9	140.1	171.8	160.7	158.2
SE	5.6	8.6	6.0	6.8	13.4	14.1	12.3	7.9	3.0	3.9	3.4	3.8
ρ (p)[a]		0.021 (0.260)				0.035 (0.340)				0.006 (0.571)		
Fish/seafood (g)												
Mean*	92.0	103.7	100.7	96.8	97.3	124.4	83.9	89.1	91.8	107.0	111.0	114.2
SE	4.3	4.0	4.2	4.2	11.3	10.2	8.1	8.0	2.0	2.2	2.4	2.7
ρ (p) [a]		0.015 (0.441)				-0.047 (0.204)				0.054 (<0.05)		
Eggs (pieces)												
Mean*	0.29	0.30	0.27	0.20	0.21	0.22	0.15	0.13	0.29	0.25	0.23	0.18
SE	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01
ρ (p) [a]		-0.025 (0.191)				-0.068 (0.067)				-0.039 (<0.05)		
Milk/milk products(g)												
Mean*	325.5	376.5	397.3	390.5	196.6	303.6	335.6	304.2	245.2	253.1	300.3	314.4
SE	14.6	13.6	13.6	13.8	27.7	24.3	26.8	27.8	5.3	5.0	5.8	6.3
ρ (p) [a]		0.089 (<0.05)				0.190 (<0.05)				0.117 (<0.05)		
Added fats/oils (g)												
Mean*	87.9	68.8	68.2	54.7	90.3	70.3	45.9	51.3	86.3	68.7	72.3	55.5
SE	4.6	3.1	3.6	3.7	12.6	10.8	4.7	6.3	3.2	1.9	2.7	2.0
ρ (p)[a]		-0.059 (<0.05)				-0.078 (<0.05)				-0.090 (<0.05)		
Potatoes (g)												
Mean*	356.8	315.8	250.9	175.6	373.3	324.6	142.0	139.1	370.6	314.5	248.0	188.1
SE	32.7	25.3	27.5	12.0	48.7	30.6	13.4	19.1	9.8	11.6	10.0	7.1
ρ (p) [a]		-0.108 (<0.05)				-0.202 (<0.05)				-0.192 (<0.05)		
Pulses (g)												
Mean*	11.5	10.0	17.5	8.2	22.1	20.1	16.5	8.7	24.7	16.3	14.4	9.4
SE	1.6	1.3	5.9	1.4	7.0	4.4	2.5	2.1	2.4	0.6	0.8	0.6
ρ (p) [a]		-0.009 (0.630)				-0.072 (0.054)				-0.067 (<0.05)		

To be continued.

Continuation Table 2: Food and beverage availability (per capita/day) in elderly Portuguese households. Household Budget Surveys from 1990 to 2005.

Food and beverage	Household Types											
	Solitary elderly female				*Solitary elderly male*				*Couple* (1 elderly female and 1 elderly male)			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Nuts (g)												
Mean*	2.82	1.67	3.03	2.24	19.57	1.60	1.23	1.28	2.44	3.30	1.94	4.48
SE	0.91	0.49	0.74	0.60	15.52	0.92	0.72	0.54	0.47	0.39	0.25	0.74
ρ (p) [a]		0.047 (<0.05)				0.024 (0.514)				0.074 (<0.05)		
Vegetables (g)												
Mean*	192.3	207.5	204.9	214.2	192.5	182.6	146.1	160.8	213.4	201.2	190.4	203.5
SE	8.8	8.0	7.0	8.1	24.9	14.4	13.7	17.5	4.7	3.5	3.7	4.1
ρ (p) [a]		0.054 (<0.05)				-0.010 (0.792)				-0.007 (0.516)		
Fruits (g)												
Mean*	262.8	235.4	277.2	278.9	187.9	187.9	192.4	224.7	226.9	191.4	239.9	233.5
SE	14.6	8.6	8.5	9.5	21.7	16.1	15.5	17.1	5.8	3.9	5.3	5.0
ρ (p) [a]		0.105 (<0.001)				0.100 (<0.05)				0.053 (<0.001)		
Sugar/sugar products (g)												
Mean*	91.1	58.9	61.5	37.4	67.3	51.3	36.0	48.4	65.2	45.9	43.2	38.3
SE	4.5	2.6	4.7	2.3	8.1	5.4	3.9	17.9	2.5	1.1	1.2	1.5
ρ (p) [a]		-0.134 (<0.05)				-0.087 (<0.05)				-0.083 (<0.05)		
Non-alcoholic beverages (ml)												
Mean*	210.0	187.6	255.8	281.0	189.4	112.0	176.1	222.1	127.0	146.2	188.3	267.2
SE	13.8	19.5	14.4	18.3	27.0	20.8	22.1	27.6	6.2	7.2	6.3	9.8
ρ (p)[a]		0.076 (<0.05)				0.050 (0.180)				0.183 (<0.05)		
Stimulants (ml)												
Mean*	124.6	100.4	120.8	73.3	89.0	52.3	64.4	46.3	73.5	77.9	73.6	66.5
SE	10.3	15.6	10.6	8.4	15.7	16.8	11.6	8.9	4.4	5.7	4.5	4.8
ρ (p)[a]		-0.048 (<0.05)				-0.034 (0.364)				0.001 (0.916)		
Bottled Water (ml)												
Mean*	68.6	58.3	87.2	169.3	84.3	27.7	84.7	145.9	41.6	42.9	64.2	158.7
SE	8.8	7.0	8.1	15.5	20.4	8.9	16.3	23.6	3.0	3.3	3.5	8.0
ρ (p)[a]		0.122 (<0.05)				0.108 (<0.05)				0.203 (<0.05)		
Fruit/ vegetable juices (ml)												
Mean*	5.30	0.71	9.20	13.0	2.75	0.33	5.90	6.70	1.04	1.00	6.10	11.00
SE	2.4	0.2	1.6	1.7	2.4	0.2	2.6	3.0	0.2	0.2	0.6	0.9
ρ (p)[a]		0.139 (<0.05)				0.087 (<0.05)				0.169 (<0.05)		

a Spearman's correlation coefficient was used to test for time trends; * Significant differences between household types for 2005 (Kruskal-Wallis test P<0.05).

Continuation Table 2: Food and beverage availability (*per capita*/day) in elderly Portuguese households. Household Budget Surveys from 1990 to 2005.

Food and beverage	Household Types											
	Solitary elderly female				*Solitary elderly male*				*Couple* (1 elderly female and 1 elderly male)			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Soft drinks (ml)												
Mean*	11.6	28.2	38.6	38.4	13.3	31.7	21.1	30.0	10.8	24.4	44.5	42.0
SE	2.3	5.1	3.5	3.9	5.6	7.2	5.2	6.8	1.5	2.2	2.2	2.1
ρ (p)[a]		0.146 (<0.05)				0.081 (<0.05)				0.229 (<0.05)		
Alcoholic beverages (ml)												
Mean*	82.2	102.5	31.4	56.0	633.2	290.0	232.4	140.6	247.7	156.4	161.7	137.8
SE	9.7	31.4	4.1	12.0	121.9	30.9	23.9	21.7	13.0	4.9	7.9	6.4
ρ (p)[a]		-0.004 (0.837)				-0.215 (<0.05)				-0.081 (<0.05)		
Wine (ml)												
Mean*	68.9	94.3	22.9	48.1	618.3	254.1	210.8	115.3	228.6	146.8	150.0	120.6
SE	8.8	31.3	3.4	11.8	121.7	26.7	22.4	21.0	12.4	4.7	7.8	6.1
ρ (p)[a]		-0.020 (0.291)				-0.245 (<0.05)				-0.091 (<0.05)		
Beer (ml)												
Mean*	12.1	7.0	5.8	5.4	10.5	31.9	18.8	20.7	15.8	7.10	10.2	12.5
SE	3.9	2.6	2.0	1.4	5.8	8.4	6.7	5.6	0.2	0.8	1.1	1.3
ρ (p) [a]		0.028 (0.134)				0.052 (0.159)				0.060 (<0.05)		
Spirits (ml)												
Mean*	1.22	1.20	2.80	2.51	4.42	4.05	2.70	4.60	3.24	2.50	1.50	4.70
SE	0.57	0.49	0.90	0.63	2.56	1.24	1.55	1.49	0.48	0.55	0.19	0.52
ρ (p) [a]		0.054 (<0.05)				0.031 (0.398)				0.061 (<0.05)		

a Spearman's correlation coefficient was used to test for time trends; * Significant differences between household types for 2005 (Kruskal-Wallis test P<0.05).

elderly male household type had the highest availability of *sugar/sugar products, alcoholic beverages*, and *beer*.

The median values of *per capita* total dietary energy (kJ) and nutrients available for elderly household types by survey year are presented in Table 3. In all household types, a significant decreasing pattern was observed for the availability of *total energy* and carbohydrates proportions, regardless of whether a general increase in the *proteins* and *SFA* proportions was found ($P<0.001$). No significant changes were observed for *cholesterol* and *MUFA*. The lipids proportion increased significantly in male and *couple* household types, but not in female ones ($P<0.05$). Only the male household type showed significantly increased values of *PUFA* ($P<0.05$). The *simple sugars* proportion increased in male households ($P<0.05$) but decreased in female and *couple* household types ($P<0.001$). In 2005, with the exception of *proteins* and *SFA* proportions, all other median values showed significant differences between household types ($P<0.05$). *Couple* households always presented the highest values for *energy* and the remaining nutrients, except for the *carbohydrates* and *simple sugars* proportions, which were higher in the *solitary elderly female* households ($P<0.001$). Except for the *simple sugars* proportion, *solitary male elderly households* presented the lowest values for *energy* and the remaining nutrients ($P<0.05$).

Discussion

This is the first study to present detailed information about dietary availability in elderly Portuguese households over a 15-year period. Attention was paid to the description and the direction of the changes in dietary availability within households with different elderly compositions, including those with a *solitary elderly female, a solitary elderly male,* and *coupled elderly* households. Our findings will be compared to the available national household dietary information and to data from other European countries. Furthermore, data from other Portuguese studies describing dietary information will be used, especially data focused on elderly individuals.

In general, over time, elderly Portuguese households reduced the availability of *cereals, added fats/oils, potatoes, and sugar/sugar products*. In contrast, the availability of *milk/milk products*, *fruits*, *bottled water*, *fruit/vegetable*

Table 3: Energy and nutrient availability (per capita/day) in elderly Portuguese households. Household Budget Surveys from 1990 to 2005.

Energy and nutrient	Household Types											
	Solitary elderly female				*Solitary elderly male*				*Couple* (1 elderly female and 1 elderly male)			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Energy (KJ)*												
Percentile 25	6,876.1	6,265.1	5,690.1	4,902.2	6,611.5	6,584.8	4,103.9	3,107.2	8,517.5	7,037.1	6,850.2	5,757.2
Median	12,331.	10,376.	10,448.	8,565.6	11,272.	10,788.	8,010.7	7,245.2	12,488.	9,865.2	9,944.3	9,056.7
Percentile 75	19,417.	15,266.	16,009.	13,888.	19,466.	15,441.	14,713.	12,107.	16,568.	14,076.	14,375.	13,442.
Mean	14,229.	11,957.	12,77.3	10,563.	15,485.	12,643.	10,158.	9,372.5	13,874.	11,439.	11,701.	10,493.
SE	373	307	354	305	972	742	539	567	200	142	179	158
ρ (p)[a]		-0.141 (<0.05)				-0.226 (<0.05)				-0.181 (<0.05)		
Proteins (% of total energy)												
Percentile 25	9.3	11.2	11.0	12.3	7.9	11.4	11.7	11.8	10.4	11.8	11.9	12.8
Median	13.1	14.0	14.8	16.1	12.1	14.0	14.4	16.0	13.4	14.4	14.9	17.1
Percentile 75	17.8	17.7	18.6	21.1	15.8	18.1	19.0	22.5	17.2	18.4	18.6	22.3
Mean	14.3	15.0	15.5	17.7	12.2	14.6	16.0	18.8	14.3	15.4	16.1	18.5
SE	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.7	0.1	0.1	0.2	0.2
ρ (p) [a]		0.176 (<0.05)				0.292 (<0.05)				0.193 (<0.05)		
Lipids (% of total energy)*												
Percentile 25	16.7	21.0	18.8	21.1	8.0	16.3	12.9	19.9	20.3	24.0	21.1	24.0
Median	31.2	32.8	31.4	32.8	20.8	28.9	26.9	31.2	32.8	34.3	32.3	34.3
Percentile 75	46.7	44.3	42.3	46.3	39.4	41.0	39.5	47.9	44.7	44.3	41.4	45.4
Mean	32.6	33.3	32.0	34.6	26.0	29.6	28.2	34.0	33.1	34.6	32.6	35.8
SE	0.7	0.6	0.5	0.6	1.4	1.1	1.0	1.2	0.4	0.3	0.3	0.4
ρ (p) [a]		0.032 (0.096)				0.144 (<0.05)				0.034 (<0.05)		
Cholesterol (mg)*												
Percentile 25	66.8	80.3	71.1	75.5	14.0	49.2	31.7	32.9	99.2	96.1	93.8	106.1
Median	174.6	162.5	154.5	161.0	78.6	140.1	11.3	131.6	184.2	173.0	170.2	193.7
Percentile 75	314.2	301.9	314.8	316.6	209.0	272.4	242.2	253.7	301.4	260.8	276.4	305.8
Mean	233.9	229.1	222.8	238.9	163.2	195.3	162.2	193.8	220.1	208.6	205.6	238.6
SE	8.7	8.7	7.9	9.6	18.2	14.4	11.7	19.7	3.7	3.5	3.5	4.7
ρ (p) [a]		-0.014 (0.471)				0.048 (0.197)				0.009 (0.426)		
MUFA (% of total energy)*												
Percentile 25	4.4	6.3	5.6	6.1	1.7	4.9	3.8	5.0	6.4	7.8	6.7	7.3
Median	9.5	12.1	11.0	10.5	6.5	11.0	9.5	9.0	12.9	14.3	12.5	12.3
Percentile 75	20.9	20.0	19.2	19.5	18.4	18.2	16.9	18.9	20.7	19.6	18.4	19.7
Mean	13.5	13.8	13.1	13.5	11.3	12.7	11.3	12.8	14.2	14.8	13.8	14.7
SE	0.4	0.3	0.3	0.4	0.9	0.7	0.6	0.7	0.2	0.2	0.2	0.2
ρ (p) [a]		0.008 (0.688)				0.065 (0.087)				-0.013 (0.230)		

MUFA- Monounsaturated fatty acids; a Spearman's correlation coefficient was used to test for time trends; * Significant differences between household types for 2005 (Kruskal-Wallis test P<0.05).

Continuation Table 3: Energy and nutrient availability (per capita/day) in elderly Portuguese households. Household Budget Surveys from 1990 to 2005.

Energy and nutrient	Household Types											
	Solitary elderly female				*Solitary elderly male*				*Couple* (1 elderly female and 1 elderly male)			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
SFA (% of total energy)												
Percentile 25	4.6	5.4	4.9	6.4	1.2	4.0	3.4	6.2	4.9	5.4	5.2	7.1
Median	7.5	7.9	7.6	9.9	4.5	6.3	7.2	9.8	7.3	7.5	7.6	9.8
Percentile 75	10.4	10.3	10.6	13.6	8.6	9.2	10.1	13.6	9.6	9.5	9.8	12.4
Mean	7.7	8.0	8.0	10.5	5.7	7.2	7.5	10.5	7.3	7.7	7.6	10.0
SE	0.2	0.1	0.1	0.2	0.4	0.3	0.3	0.4	0.1	0.1	0.1	0.1
ρ (p)[a]		0.170 (<0.05)				0.290 (<0.05)				0.211 (<0.05)		
PUFA (% of total energy)*												
Percentile 25	2.0	2.9	2.3	2.8	1.8	2.4	2.1	2.4	2.7	3.8	2.9	3.1
Median	3.8	5.2	4.0	4.1	2.9	3.8	3.3	3.9	4.5	7.3	5.1	5.2
Percentile 75	12.2	11.4	9.8	7.9	5.9	9.3	8.2	7.9	11.7	11.3	9.8	10.4
Mean	7.3	7.3	6.4	6.5	5.4	5.9	5.3	6.6	7.5	8.0	6.8	7.1
SE	0.3	0.2	0.2	0.2	0.4	0.3	0.3	0.4	0.1	0.1	0.1	0.1
ρ (p)[a]		-0.010 (0.606)				0.077 (<0.05)				-0.015 (0.162)		
Carbohydrates (% of total energy)*												
Percentile 25	41.4	43.4	44.5	37.9	37.5	40.0	38.8	32.3	41.6	40.8	40.9	34.5
Median	55.3	53.6	54.1	50.7	54.4	52.1	53.9	43.5	50.6	49.3	50.6	45.5
Percentile 75	68.5	64.0	66.6	62.5	69.2	62.7	67.0	61.6	61.2	57.9	60.6	56.7
Mean	55.3	54.2	55.6	49.8	53.2	52.3	53.7	46.6	51.4	49.5	51.2	45.5
SE	0.7	0.6	0.5	0.6	1.5	1.2	1.2	1.3	0.3	0.3	0.3	0.4
ρ (p)[a]		-0.088 (<0.05)				-0.107 (<0.05)				-0.101 (<0.05)		
Simple sugars (% of total												
Percentile 25	11.0	11.0	12.6	9.0	4.1	7.4	8.4	7.0	10.4	9.5	10.8	8.6
Median	19.9	16.9	18.7	15.3	12.4	13.2	14.3	14.4	16.4	13.9	15.8	13.3
Percentile 75	29.3	24.0	27.2	23.1	24.2	20.8	23.5	22.1	22.9	19.5	21.7	19.9
Mean	22.5	18.7	21.4	17.8	15.9	16.0	18.1	17.3	17.5	15.3	17.3	15.5
SE	0.6	0.4	0.4	0.4	1.1	0.9	1.0	0.9	0.2	0.2	0.2	0.2
ρ (p) [a]		-0.097 (<0.05)				0.075 (<0.05)				-0.066 (<0.05)		

SFA- Saturated fatty acids; PUFA-Polyunsaturated fatty acids; a Spearman's coefficient was used to test for time trends; * Significant differences between household types for 2005 (Kruskal-Wallis test P<0.05).

juices, and *soft drinks* increased. The main changes in food and beverages availability within the elderly households are in line with those observed for the entire Portuguese population[19,36,38]. However, data from the last edition of the National Health Survey[16] on direct measures of intake revealed that cereals, such as rice, pasta, and bread, as well as potatoes were products that were present in approximately 90% of Portuguese meals. Although elderly households may be more traditional than other households in their household food availability, results may indicate a transition from the traditional diet to a more "modern" one. In particular, the increase over time of *milk/milk products*, *bottled water*, *fruit/vegetable juices*, and *soft drinks* may exemplify the "modernization" of dietary availability because these products became more readily available in the late 1990s[16,39]. An increasing pattern for *soft drinks* over the years was also found in European countries, where its availability is steady and increasing significantly[22]. Considering other food groups, our results are in line with other studies, despite the higher availability of *cereals* and *fish/seafood* among elderly Portuguese households[21,24,36,40]. Compared to other European countries, Portugal reports a reduction in the household availability of most food items[21,36]. Our findings for elderly households revealed an over time decrease in total energy that is just accompanied for a reduction in some food items.

Our results showed an increase in the availability of *fruits*. Higher availability of fruits was also found in Southern European countries in comparison with Northern European countries. A study by Naska *et al* (2000)[41] using HBS data to assess fruit and vegetable availability patterns in ten European countries reported similar findings. However, the differences in fruit and vegetable consumption that were previously identified between Mediterranean and Northern European countries seem to be leveling out[42].

We found that elderly female individuals living alone had increased availability of *vegetables*, and this group's availability of *fruits* and *vegetables* in 2005 was the highest of all elderly household types. Sex differences in fruit and vegetable intake among older adults were also reported in a study by Baker and Wardle (2003)[43]. Their results showed that

women ate significantly more fruits and vegetables than men and that men's poorer nutrition knowledge could explain a significant part of their lower intake of these foods. This situation may also be related to elderly females' concern with nutrition and healthy choices, aspects noted by a study on the determinants of food choice and the food habits of elderly populations, which included Portuguese individuals[44]. Alternatively, living alone may cause a loss of interest and ability in cooking, leading to the substitution of meals by more convenient food items, such as milk/milk products and fruits. Furthermore, the sociodemographic characteristics of these households may be linked to household food availability. For example, the coupled elderly households showed the highest availability for nine of the fourteen food and beverages items analyzed. Additionally, the presence of a woman and/or another person, such as in the coupled elderly households, may play an important role in household dietary availability, as described by Morais (2013)[44]. Our results regarding higher availability of food and beverage groups in *coupled* and *solitary elderly female* household types may indicate this phenomenon. Moreover, over the years, the elderly households were increasingly located in urbanized areas, which impose a different lifestyle that may have contributed to differing food availability within these households. The higher median values of the *eating out expenses* of *solitary elderly male* households may be related to this situation. Similar results were presented by Morais (2013)[44].

Over time, the availability of *alcoholic beverages* decreased within elderly households, but *solitary elderly males* had the highest mean values for the availability of these items. Other studies using direct measures of intake have reported that men have higher ethanol intake[45] and alcohol intake than woman[16,46,47]. A study by Vaz de Almeida *et al* (2005)[48] produced similar findings. Their investigation of the social and cultural aspects of alcohol consumption in a sample of older people in eight European countries revealed that alcohol consumption was connected with culture and that it had social and psychological implications. Their results also suggested that alcohol intake in Southern European countries is a long-established and entrenched social behavior that is related to male preferences and male conviviality. We also need to consider that the substantial variation over time in some of the

analyzed food groups may have to do with differences in the food group definition, mistake or genuine disparity can be highlighted as some of the plausible explanation to our findings.

Considering overall household food availability, the elderly higher food availability may reflect less frequent eating out[49] and/or a tendency to accumulate food in the household. Over time other studies have reported the decrease of inside household dietary availability[38] which is certainly due to the increase of eating out of home, for which expenses significantly increased in populations[49], which was also found in this study results. Our results show that the energy and macronutrient contribution to the total energy available in elderly households changed over time. The availability of total energy and the proportion of carbohydrates decreased over time, whereas the proportion of protein and SFA increased. Similar results were found for other European countries[42]. However, we found that the *solitary elderly female* household type experienced a decrease in the proportion of lipids, which may be related to female health concerns, as highlighted by other studies[46].

Few studies have analyzed elderly dietary data in Portugal. Despite methodological differences[27,45,50], some comparisons can be performed. In Epi-Porto[45], macronutrient adequacy was analyzed, showing that older individuals consumed less than 20% of their total energy from fat. Men aged 70 years and older presented the lowest inadequacy proportion of carbohydrate intake. Marques-Vidal *et al* (2006)[50] studied representative samples of the Portuguese population and found that, in general, the consumption of traditional foods such as fish and soup declined, but in a smaller proportion among elderly people. They also commented that at the individual level, higher consumption of meat and milk would contribute to higher relative protein and fat intake.

Comparing our results with the population's nutrient intake goals[4], we found that the median values for the proportion of protein and lipids exceeded the recommendations, and the median values of carbohydrate proportions were below the recommendations. Rodrigues *et al* (2006)[30] analyzed the availability of food, energy, and nutrients for elderly people living alone. Their results showed that the availability of sugar and sugar products was above the

median for the total population. Their most relevant findings were the low availability of energy derived from carbohydrates and high values for total dietary energy, protein, and fats.

Another study by Rodrigues *et al* (2007)[23] revealed that Portuguese solitary elderly households and households with two elderly members presented low levels of compliance with the WHO dietary goals. Furthermore, other study reported low dietary quality levels for European elders[29]. Therefore, highlighting that sociodemographic differences in dietary profile should be considered when designing health and nutrition initiatives.

Portuguese household food availability data from HBS has been analyzed within the Data Food Networking (DAFNE) initiative since the 1990s, contributing to information about the country's dietary patterns[19,24,38]. The HBS are surveys that are regularly conducted at the country level with information based on descriptions of the food entering the household (identification of the food quantity acquired and the amount of money spent). Despite various limitations, the HBS have been used to describe food availability in Portugal, and they represent an important source of nationally-representative dietary information. These characteristics can be considered strengths of our study. Nevertheless, the HBS also present some drawbacks. For instance, the fact that one cannot determine the fraction of food acquired that was not consumed (e.g., loss, waste, fed to pets), the non-specification of the consumption of food and beverage outside the household, and the inability to estimate the real distribution of food among household members can be considered some of the limitations of these sources of information in the characterization of diets. Sampling process issues, the sampling period adopted as a reference for the calculation of food supplies, and limitations to the process of collecting, recording, and interpreting the data also deserve special consideration when reporting and analyzing the results of these studies[51-53]. In general, the different time periods of data collection (seven days in 1990 and 14 days from 1995 onwards) used in the analyzed surveys is not expected to impair comparisons. However, it may have an impact in the means values of the rarely consumed foods/beverages, which might be lower in 1990 than in the following years. Another important

issue is the fact that elderly Portuguese individuals in urban and rural areas have coverage of home care services, including the provision of meals, which may affect measures of household food availability by HBS surveys.
The lack of detailed information about food items acquired outside the household is a limitation when using HBS food, beverages, and nutrient-derived data. However, it is important to note that households with older persons generally present fewer food expenses outside the household[44,49].

The results presented in this paper reveal differences in household food availability among elderly household types. The increase in the availability of *milk/milk products* and *non-alcoholic beverages* together with the decrease in *cereals*, and *potatoes* suggest that food items are being replaced over time turning these population food pattern more closely associated with the so called "modern" diet[54]. A healthier trend was observed in the global decreasing of *sugar/sugar products and in* increasing availability of *fruits* and *vegetables* and the decreasing availability of *alcoholic beverages* for *solitary elderly female* and *coupled* households, as also noted by Rodrigues *et al* (2010)[38] for the entire population.
Given the need to make decisions about nutritional and health policies designed for older persons, our findings provide recommendations to achieve healthier dietary availability among elderly households. Our results encourage the increased availability of traditional foods, such as pulses and fish, which are components of the Mediterranean diet and are part of the Portuguese cultural heritage. These recommendations may help to improve dietary quality by contributing to a reduction of lipid proportions and an increase in the carbohydrate proportion.
The demographic changes characterized by the increase of the elderly population have occurred in conjunction with changes in habits, including the characteristics of dietary availability in households. Further research using direct measures of food intake and regular dietary monitoring are needed to clarify the dietary habits of older people and their association with sociodemographic characteristics. The use of HBS dietary data should be expanded and improved by exploring different household compositions to improve knowledge about elderly groups. This research would contribute to

revealing disparities and would constitute a basis for developing national and regional nutrition policies aimed at increasing the food-related health and wellbeing of this specific age group, especially in light of the need to incorporate a life course approach[11]. Combining HBS dietary data with direct measures of food intake could further clarify the dietary habits of older people and their association with sociodemographic characteristics.

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4.3 Artigo 3: Diet quality in Portuguese households with elderly members

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Abstract

Objective: To identify diet quality time trends in Portuguese households with elderly members and the association of diet quality with sociodemographic characteristics.

Design: Set of four cross-sectional studies.

Setting: Portuguese population.

Subjects: Nationally representative samples from Household Budget Surveys (1989-1990, 1994-1995, 2000-2001 and 2005-2006 versions) of households with elderly members aged ≥ 65 years categorized as *solitary elderly female*, *solitary elderly male,* or *elderly couple* (composed of one elderly female and one elderly male) compared with adult households with the same composition.

Methods: Diet quality was assessed through a revised version of the Healthy Diet Indicator (HDIr). Univariate and multiple backward linear regression models were used to study the association with sociodemographic characteristics.

Results: Mean values of dietary index were low and the proportion of elderly households with low diet quality (HDIr≤4) was high (between 47.4% and 68.4%). However, the frequency of HDIr inadequacy for adults households members was even higher ($P<0.05$). In general, adjusted coefficients for survey year, educational level of the household head, and eating out expenses were inversely associated with HDIr; whilst semi-urban and rural location of

the households predicted higher HDIr values. Exceptions were found in elderly male households where the educational level of the household head was positively associated with HDIr values.
Conclusions: Overall, diet quality was low and decreased over time but lonely elderly female and elderly couple households had higher values of HDIr. Adherence to a healthier diet was associated with lower educational level of the household head and location of the household in less urbanized areas.

Keywords: diet quality, elderly, Household Budget Survey, Portugal.

Introduction

As life expectancy increases, elderly people represent the fastest-growing age group, globally and in Portugal[1]. Scientific evidence shows that changes in dietary and lifestyle patterns impact on the occurrence of chronic non-communicable diseases and consequently increase the causes of disability and premature death[2]. Strong emphasis has been given to dietary recommendations for the prevention of several chronic diseases, their consequences[3], and their relationship with healthy ageing[4,5].

Measures of overall diet quality, such as dietary indices, are indicated for reporting dietary patterns and their relationship to disease in epidemiologic studies[6]. In addition, these indices simplify the interpretation of dietary trends and disparities[6,8].

Examining the dietary characteristics of the elderly is important because it allows the recognition of subgroups at risk of malnutrition or disease[9,10]. Another important issue is that their dietary patterns as a whole seem to be more important than their specific dietary components in terms of survival[11] . Sociodemographic characteristics have been reported as important determinants of health, nutritional wellbeing[12-15] and dietary availability[16-18]. Economic constraints may interfere with the capacity to select food and to access a nutrient-dense diet, especially among low socioeconomic groups[17-19]. Furthermore, dietary indices and the identification of their determinants can also provide a guide for the development of effective nutritional interventions.

Although dietary characteristics have been researched previously in Portugal, only a few population-based studies describing the Portuguese diet have been published[7,20-24]. The availability of such studies with the elderly population is even scarcer and fragmented, a phenomenon that has long been highlighted[24-27]. Notwithstanding the fact that many multi-dimensional indices of diet quality have been proposed, few studies have specifically investigated the determinants of food choices and diet quality on the elderly population in Europe[28]. Therefore, this study aims to identify diet quality time trends in

Portuguese households with elderly members and the association of diet quality with sociodemographic characteristics.

Methodology

Study design and subjects

Data from four cross-sectional Portuguese Household Budget Surveys (HBS) were used. Nationally representative samples were obtained using the multiple stages process[29-32]. Surveys were conducted by the Portuguese National Statistics Institute[29-32]. Households with elderly members aged ≥ 65 years[33] categorized as *solitary elderly female*, *solitary elderly male,* and *elderly couple* (composed of one elderly female and one elderly male) compared with adult households with the same composition (*solitary adult female, solitary adult male and adult couple*) were selected. Our sample comprised 3,733 households in 1989-1990, 3,588 households in 1994-1995, 4,003 households in 2000-2001, and 4,294 households in 2005-2006.

Sociodemographic variables

Sociodemographic variables were taken as proxies for the family social welfare and lifestyle.

The educational level of the household head was classified as *illiterate/elementary* (no formal education up to 6 years of formal education); *secondary* (from 7 to 12 years of formal education); and *higher* (bachelor's degree, master's and PhD). Money availability was estimated by *per capita* income (Euro/*per capita*/day), and eating out expenses were expressed as the representativeness of outside home food expenditure in the total food expenditure (%). Household location followed the Portuguese NUTS 2 regions (*North, Central, Lisbon and Tejo Valley, Alentejo, Algarve, Azores* and *Madeira*), and urbanisation level was categorised as *rural, semi-urban* and *urban*.

Dietary quality estimates

Dietary HBS information refers to food purchases, obtained through self-registration of food items entering the household (purchased, home-produced or received as gifts) during 7 days in 1989-1990 and 14 days from 1994-1995 onward. Information was collected throughout the year to capture seasonal variation. The data obtained through an open questionnaire were

subsequently recorded into approximately 500 codes and then categorised into 15 food groups according to the DAta Food NEtworking (DAFNE) classification scheme[34-35]. The *per capita* daily food availability was estimated through the division of the household daily food availability by the household dimension for the 15 main food and beverages groups. The average energy and nutrient availability (quantity/person/day) within the households was estimated using MicrodietPlus for Windows Version 1.1 2000, adapted to include Portuguese foods[36].

Diet quality was assessed through a revised version of the Healthy Diet Indicator (HDIr)[7]. For each of the eleven HDIr criteria (see table 1), one point was given if the *per capita* household daily dietary availability was within the recommended values, otherwise, zero points were

Table 1: Criteria used to compute the revised version of the Healthy Diet Indicator – HDIr*.

HDIr criteria[a]
10-15% energy from protein
50-70% energy from complex carbohydrates
< 10% energy from simple sugars
< 10% energy from saturated fatty acids
6-10% energy from polyunsaturated fatty acids
< 300 mg cholesterol
> 25 g dietary fibre
≥ 400 g fruits and vegetables
≥ 30 g pulses and nuts
< 200 mg sodium
< 4% energy from alcohol

a - The HDIr criteria by Rodrigues et al (2007) [7].

given. Hence, the HDIr range from 0 to 11. These values were subsequently categorised as *low* (HDIr≤4), *intermediate* (HDIr 5 to 6), and *high* (HDIr≥7)[7].

Statistical methods

Weights were used to account the sample design effect. The *per capita* income had a positively skewed distribution; therefore, a log transform was used to decrease the skewness. The Portuguese regions and urbanisation

levels were recoded as dummy variables assuming North and urban as reference categories, respectively. Differences between groups were studied using the chi-square and Kruskal Wallis tests. Spearman correlation coefficients were computed to evaluate time trends. Kendall's tau correlation coefficient verified the existence of monotonic association between HDIr with survey year and each sociodemografic characteristic (educational level of the household head, income, eating out expenses, household location and urbanisation level). Every Kendall's tau correlation coefficient was significant for each of the household types. Univariate linear regression model assessed the unadjusted relationships between HDIr and each of the studied variables (survey year, educational level of the household head, income, eating out expenses, Portuguese NUTS 2 regions and urbanisation level of the household). Backward multivariate linear regression was used to assess the adjusted effect on HDIr from the studied variables. All the variables were included in the first step. The assumption of normality of the error term was met. The analysis was conducted by separately considering the households with and without elderly members. All reported *P*-values are two-sided and considered to be statistically significant at the 0.05 level. The statistical analysis was performed in IBM SPSS 20.0.

Results

Table 2 presents the comparison of sociodemographic characteristics between elderly and adult households. The households had significant differences in each of the studied sociodemographic characteristics ($P<0.05$). Lower educational level of the household head, lower incomes, less eating out expenses and location in less urbanized areas were the elderly household's main characteristics.

On average, there was an increase, over time, in household income and eating out expenses. There were also a rise in the educational level of household head and the level of urbanization of the households.

Diet quality data for elderly and adult households are presented in Table 3. For each household type, the mean values of the HDIr were below 5 points

and decreased over time, more markedly for solitary adult female (ρ=-0.195) followed by solitary elderly male (ρ=-0.143) households. Households with elderly members presenting low HDIr levels (up to 4 points) ranged between 47.4% up to 68.4%, values in general lower than those from adult households, between 45.9% up to 81.8%, the exception being solitary adult females in 1990.

The association between HDIr, survey year and sociodemographic variables for elderly and adult households is shown in Table 4. In general, across the household types, adjusted coefficients for survey year, educational level of the household head, and eating out expenses were inversely associated with HDIr values, except for solitary elderly male households where the adjusted coefficients for the educational level of the household head was positively associated with HDIr values. The location of the households in semi-urban and rural areas predicted higher HDIr values for all household types. We also observed regional variations, depending on the household type.

Discussion

The Portuguese household diet quality was poor (HDIr below 5 points) and it worsened over the analysed 15-year period, results also found for European elderly[28], using another dietary score. Diet quality in Portuguese households with elderly members was slightly better than those found in adult ones, except for adult females in 1990. Better dietary quality among the elderly can be explained by their lower consumption of processed food items[37] and less eating out expenditure[45]. Previous results also reported that the dietary pattern of Portuguese households worsened over time[7,8, 14-16, 21-24]. This paper is the first to exclusively analyse diet quality in representative samples of Portuguese households categorized as *solitary elderly female*, *solitary elderly male,* or *elderly couple* compared with adult households with the same composition. This stratification allowed having a clear view of the effect of age and gender.

Table 2: Sociodemographic characteristics of elderly and adult Portuguese households, Portuguese Household Budget Surveys from 1990 to 2005.

Socioeconomic Characteristics	Elderly Household Types											
	Solitary elderly female				*Solitary elderly male*				*Elderly Couple* 1 elderly female and 1 elderly male			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Sample size (n)	744	824	1,02	913	204	242	296	281	1,019	1,15	1,21	1,247
Education level of the head of household (%)[1]												
Illiterate/Elementary	96.7	92.4	91.0	90.9	91.8	93.3	95.0	88.0	92.1	91.8	87.8	89.3
Secondary	2.2	5.2	5.0	6.6	6.3	3.1	3.8	7.2	6.0	6.8	9.0	7.4
Higher	1.1	2.4	4.0	2.5	1.9	3.6	1.3	4.8	1.9	1.4	3.2	3.4
ρ (*P*)[a]		0.073 (<0.05)				0.058 (0.118)				0.043 (<0.05)		
Level of urbanisation (%)[2]												
Urban	48.8	54.8	48.0	66.1	42.3	37.1	49.4	58.8	45.3	44.3	44.8	60.5
Semi-urban	18.3	22.9	25.8	12.6	23.6	32.1	26.6	18.0	20.4	27.4	26.7	14.0
Rural	32.9	22.3	26.3	21.3	34.1	30.8	24.1	23.2	34.3	28.3	28.5	25.5
ρ (*P*)[a]		-0.106 (<0.05)				-0.195 (<0.05)				-0.071 (<0.05)		
Location in Portuguese regions (%)[2]												
Mainland Portugal												
- North	28.1	27.2	26.3	28.6	32.5	24.6	24.5	26.4	27.0	30.4	29.4	27.5
- Central	20.4	18.3	21.2	24.8	23.9	28.6	16.2	26.4	21.4	21.2	20.8	29.0
Lisbon and Tejo Valley	32.6	40.1	38.0	29.2	27.8	29.5	37.8	29.2	33.3	34.2	34.5	24.6
- Alentejo	8.7	6.1	7.1	10.4	6.2	10.3	10.4	9.6	9.4	7.3	7.8	11.9
- Algarve	6.1	4.0	4.3	4.4	6.2	4.0	8.3	6.4	6.2	4.4	4.9	4.8
Autonomous regions												
- Azores	2.0	1.6	1.5	1.4	1.9	1.8	1.2	1.2	1.5	1.5	1.2	1.1
- Madeira	2.0	2.7	1.8	1.3	1.4	1.3	1.7	0.8	1.2	1.0	1.3	1.0

Socioeconomic Characteristics	Adult Household Types											
	Solitary adult female				*Solitary adult male*				*Adult Couple* 1 adult female and 1 adult male			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Sample size (n)	354	284	336	345	122	180	162	292	1,290	905	972	1,216
Educational level of the head of household (%)[1]												
Illiterate/Elementary	85.4	69.6	73.2	52.7	76.3	58.6	50.9	50.3	84.1	81.7	75.9	60.2
Secondary	8.1	14.9	14.2	26.6	12.3	25.7	26.1	35.5	12.6	11.8	17.9	26.3
Higher	6.5	15.6	12.6	20.7	11.4	15.8	23.0	14.2	3.3	6.4	6.2	13.5
ρ (*P*)[a]		0.264 (<0.05)				0.101 (<0.05)				0.215 (<0.05)		
Level of urbanisation (%)[2]												
Urban	52.2	67.3	64.5	81.4	50.0	63.8	72.1	76.7	51.6	57.1	59.1	77.3
Semi-urban	19.5	16.0	22.1	10.7	21.1	19.1	13.3	10.6	22.0	24.7	23.6	11.4
Rural	28.4	16.7	13.4	7.9	28.9	17.1	14.5	12.7	26.4	18.1	17.4	11.2
ρ (*P*)[a]		-0.246 (<0.05)				-0.181 (<0.05)				-0.183 (<0.05)		
Location in Portuguese regions (%) [b2]												
Mainland Portugal												
- Central	26.8	22.8	28.2	24.9	25.4	25.2	14.5	23.4	26.2	23.4	26.9	30.5
- Lisbon and Tejo Valley	17.8	21.7	15.1	17.8	7.0	16.6	12.1	21.0	18.9	18.7	15.3	22.0
- Alentejo	41.9	40.2	46.3	42.9	37.7	37.7	60.0	38.5	40.1	42.4	45.5	32.8
- Algarve	7.0	5.4	3.8	7.3	10.5	7.9	3.6	7.4	8.0	7.3	5.4	6.8
Autonomous regions	3.0	6.5	3.6	4.0	14.9	7.9	6.1	6.8	4.0	5.0	4.0	4.5
Autonomous regions												
- Azores	1.1	1.4	1.4	1.4	2.6	3.3	2.4	1.5	1.5	1.9	1.5	1.9
- Madeira	2.4	1.8	1.6	1.7	1.8	1.3	1.2	1.5	1.3	1.3	1.2	1.5

To be continued.

Continuation Table 2: Sociodemographic characteristics of elderly and adult Portuguese households, Portuguese Household Budget Surveys from 1990 to 2005.

Socioeconomic Characteristics	Elderly Household Types											
	Solitary elderly female				*Solitary elderly male*				*Elderly Couple* 1 elderly female and 1 elderly male			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Income (*Per capita*/*per* day in Euros)[1]												
P25	2.8	6.2	6.6	13.8	3.1	6.0	7.5	16.7	2.7	5.4	6.1	12.0
Median	4.2	8.9	9.8	18.7	4.5	8.7	10.1	23.9	3.6	7.4	8.1	15.9
Mean	4.9	12.2	12.6	23.6	7.1	13.0	15.7	32.1	4.9	9.7	11.8	20.9
P75	6.2	13.3	12.7	26.8	7.5	14.0	19.1	34.9	5.7	11.2	12.7	23.8
SE	0.1	0.4	0.4	0.6	0.6	0.9	0.9	1.9	0.1	0.2	0.2	0.4
ρ (*P*) [a]		0.669 (<0.05)				0.672 (<0.05)				0.673 (<0.05)		
Eating out expenses (% of total food expenditures) [1]												
P25	0.0	0.0	0.0	0.0	0.0	0.0	4.8	10.3	0.0	0.0	0.0	0.0
Median	0.0	0.0	0.0	2.9	11.6	2.1	30.1	54.2	0.0	0.0	0.7	4.8
Mean	16.8	14.1	17.0	22.3	27.8	23.4	38.2	48.8	7.7	9.2	11.7	15.2
P75	29.4	18.8	22.4	37.6	54.0	43.7	68.9	83.3	6.7	11.6	14.4	23.0
SE	1.0	0.9	0.9	1.1	2.3	2.2	2.2	2.4	0.3	0.4	0.4	0.5
ρ (*P*)[a]		0.112 (<0.05)				0.276 (<0.05)				0.161 (<0.05)		

Socioeconomic Characteristics	Adult Household Types											
	Solitary adult female				*Solitary adult male*				*Adult Couple* 1 adult female and 1 adult male			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Income (*Per capita*/*per* day in Euros) [1]												
P25	4.0	9.4	9.5	20.1	4.1	9.7	13.6	21.6	4.5	8.3	10.0	6.6
Median	6.0	16.2	15.2	32.9	9.3	18.8	25.4	31.7	6.3	12.3	14.9	25.2
Mean	8.1	21.9	23.0	38.2	11.2	30.8	35.0	39.4	8.0	16.0	19.0	34.5
P75	9.8	27.8	25.6	48.1	15.0	50.0	45.7	48.5	9.6	18.9	22.0	39.1
SE	0.3	1.1	1.3	1.4	0.8	2.6	2.5	1.5	0.1	0.3	0.4	0.8
ρ (*P*)[a]		0.602 (<0.05)				0.393 (<0.05)				0.652 (<0.05)		
Eating out expenses (% of total food expenditures) [1]												
P25	0.0	0.0	0.0	5.9	1.5	24.3	30.2	26.4	0.0	0.0	3.73	9.0
Median	5.2	13.3	21.0	31.2	41.3	66.4	56.7	64.7	7.6	12.2	16.1	26.5
Mean	18.1	26.7	29.2	36.5	44.9	56.8	57.0	56.1	17.2	20.3	23.6	32.6
P75	31.5	46.6	49.6	63.6	86.2	88.1	85.9	86.6	29.3	32.9	37.5	52.2
SE	1.2	1.8	1.6	1.7	3.6	2.8	2.5	1.8	0.4	0.6	0.5	0.6
ρ (*P*)[a]		0.246 (<0.05)				0.048 (0.217)				0.242 (<0.05)		

a - Spearman coefficient was used to test for time trends.

1- Kruskal Wallis test for differences between household types P<0.05 for 1990, 1995, 2000 and 2005.

2- Chi-Square test for differences between household types P<0.05 for 1990, 1995, 2000 and 2005.

Table 3: Diet quality in elderly and adult Portuguese households, Portuguese Household Budget Surveys from 1990 to 2005.

Diet quality (HDIr)[a]	Elderly Household Types											
	Solitary elderly female				*Solitary elderly male*				*Elderly Couple* 1 elderly female and 1 elderly male			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Mean[1]	4.27	4.56	4.39	4.05	4.28	4.46	4.22	3.77	4.41	4.58	4.44	3.93
SE	0.05	0.05	0.05	0.05	0.11	0.10	0.09	0.10	0.03	0.32	0.03	0.03
ρ (P) [b]		-0.082	(<0.05)			-0.143	(<0.05)			-0.108	(<0.05)	
HDIr levels (%)[2]												
Low (≤ 4)	56.3	50.7	57.5	64.2	54.6	53.8	60.6	68.4	53.6	47.4	52.5	67.7
Intermediate (5-6)	38.2	40.2	34.2	31.7	36.2	35.4	33.2	26.4	36.8	41.6	38.2	28.2
High (≥ 7)	5.4	9.2	8.3	4.1	9.2	10.8	6.2	5.2	9.6	11.0	9.3	4.1

Diet quality (HDIr)[a]	Adult Household Types											
	Solitary adult female				*Solitary adult male*				*Adult Couple* 1 adult female and 1 adult male			
	1990	1995	2000	2005	1990	1995	2000	2005	1990	1995	2000	2005
Mean[1]	4.39	4.24	4.04	3.67	4.04	3.62	3.45	3.35	4.28	4.32	4.01	3.61
SE	0.08	0.09	0.07	0.07	0.16	0.11	0.11	0.08	0.03	0.04	0.04	0.03
ρ (P) [b]		-0,195	(<0.05)			-0.119	(<0.05)			-0.170	(<0.05)	
HDIr levels (%)[2]												
Low (≤ 4)	45.9	59.1	66.0	70.9	59.6	74.3	81.8	79.4	53.8	53.5	64.6	73.7
Intermediate (5-6)	49.5	33.7	29.9	27.4	32.5	23.0	14.5	19.8	38.6	36.7	29.0	24.0
High (≥ 7)	4.6	7.2	4.1	1.7	7.9	2.6	3.6	0.9	7.5	9.8	6.4	2.3

a- Revised version of the Healthy Diet Indicator by Rodrigues *et al*, (2007) [7].

b - Spearman coefficient was used to test for time trends.

1- Kruskal Wallis test for differences between household types $P>0.05$ for 1990 and $P<0.05$ for 1995, 2000 and 2005.

2- Chi-Square test for differences between household types $P<0.05$ for 1990, 1995, 2000 and 2005.

Table 4: Univariate and multivariate linear regression models between diet quality, survey year and sociodemographic characteristics of Portuguese elderly and adult households, Portuguese Household Budget Surveys from 1990 to 2005.

Variables analyzed	Elderly Household Types											
	Solitary elderly female				*Solitary elderly male*				*Elderly Couple* 1 elderly female and 1 elderly male			
	Univariate[a]	*P*-value	Multivariate[b]	*P*-value	Univariate[a]	*P*-value	Multivariate[b]	*P*-value	Univariate[a]	*P*-value	Multivariate[b]	*P*-value
Survey year	-0.017	0.000	-0.008	0.070	-0.037	0.000	-0.018	0.046	-0.031	0.000	-0.022	0.000
Educational level of the	-0.352	0.000	-0.201	0.002	0.311	0.013	0.477	0.000	-0.568	0.000	-0.317	0.000
Log income (*Per capita* in	-0.486	0.000			-0.479	0.000			-0.750	0.000		
Eating out expenses (%)	-0.011	0.000	-0.010	0.000	-0.011	0.000	-0.010	0.000	-0.013	0.000	-0.009	0.000
Portuguese regions (%) – comparison with North												
Mainland Portugal												
- Central	0.315	0.000	0.160	0.011	0.137	0.247			0.234	0.000	0.090	0.022
- Lisbon and Teio Valley	-0.188	0.000			0.011	0.921			-0.204	0.000		
- Alenteio	-0.183	0.045	-0.254	0.006	-0.203	0.244			0.028	0.618		
- Algarve	0.168	0.157			-0.032	0.879			0.163	0.029		
Autonomous regions												
- Azores	-0.471	0.018	-0.632	0.001	-0.268	0.523			-0.072	0.608	-0.238	0.083
- Madeira	0.305	0.091			0.204	0.660			0.239	0.119		
Level of urbanisation – comparison with urban												
Semi-urban	0.149	0.016	0.171	0.008	-0.041	0.723			0.201	0.000	0.268	0.000
Rural	0.367	0.000	0.354	0.000	0.401	0.000	0.344	0.002	0.464	0.000	0.422	0.000

Variables analyzed	Adult Household Types											
	Solitary adult female				*Solitary adult male*				*Adult Couple* 1 adult female and 1 adult male			
	Univariate[a]	*P*-value	Multivariate[b]	*P*-value	Univariate[a]	*P*-value	Multivariate[b]	*P*-value	Univariate[a]	*P*-value	Multivariate[b]	*P*-value
Survey year	-0.047	0.000	-0.029	0.000	-0.040	0.000	-0.030	0.001	-0.045	0.000	-0.025	0.000
Educational level of the	-0.361	0.00	-0.104	0.082	-0.406	0.000	-0.294	0.000	-0.558	0.000	-0.239	0.000
Log income (*Per capita* in	-0.795	0.000			-0.757	0.000			-0.967	0.000		

To be continued.

Continuation Table 4: Univariate and multivariate linear regression models between diet quality, survey year and sociodemographic characteristics of Portuguese elderly and adult households, Portuguese Household Budget Surveys from 1990 to 2005.

Variables analyzed	Adult Household Types											
	Solitary adult female				*Solitary adult male*				*Adult Couple* 1 adult female and 1 adult male			
	Univariate[a]	*P*-value	Multivariate[b]	*P*-value	Univariate[a]	*P*-value	Multivariate[b]	*P*-value	Univariate[a]	*P*-value	Multivariate[b]	*P*-value
Eating out expenses (%)	-0.010	0.000	-0.006	0.000	-0.014	0.000	-0.012	0.000	-0.015	0.000	-0.009	0.000
Portuguese regions (%) – comparison with North												
Mainland Portugal												
- Central	0.376	0.000			0.117	0.412			0.310	0.000		
- Lisbon and Tejo Valley	-0.397	0.000	-0.208	0.012	-0.058	0.588			-0.368	0.000	-0.205	0.000
- Alentejo	0.154	0.364			0.301	0.141			0.391	0.000		
- Algarve	-0.067	0.742			-0.068	0.724			-0.013	0.870	-0.146	0.062
Autonomous regions												
- Azores	-0.356	0.314	-0.659	0.052	0.031	0.933			-0.149	0.247	-0.459	0.000
- Madeira	0.521	0.081			0.073	0.871			0.073	0.615		
Level of urbanisation – comparison with urban												
- Semi-urban	0.494	0.000	0.449	0.000	0.104	0.488			0.418	0.000	0.337	0.000
- Rural	0.656	0.000	0.446	0.000	0.403	0.005			0.714	0.000	0.503	0.000

a- Unstandartized coefficients from the univariate linear regression model.

b- Unstandartized coefficients from the multivariate linear regression model. The first step included all the 12 variables for each household type. Only the final step is shown.

Model description according household types:

Solitary elderly female households- the final model took 5 steps: R= 0.268; *P*< 0.05; Std. error= 1.38.

Solitary elderly male households- the final model took 9 steps: R=0,305; *P*<0.05; Std. error= 1.45.

Couple elderly households- the final model took 6 steps: R=0.253; *P*<0.05; Std. error=1.47.

Solitary adult female households- the final model took 6 steps: R=0.310; *P*<0.05; Std. error=1.41.

Solitary adult male households- the final model took 10 steps: R=0.377; *P*<0.05; Std. error=1.36.

Couple adult households - the final model took 5 steps: R=0.331; *P*<0.05; Std. error=1.47.

Rodrigues *et al.* (2007)[7] conducted the first study using the HDIr index with HBS-derived data. In line with our results, they found that households with elderly members were more likely to have a better diet quality level than those households without elderly members. Lower diet quality of Portuguese elders was also reported by another study[12], which used the adherence index to Mediterranean dietary patterns (MDP). Their results[12], in line with ours, also indicated that elderly couple households were those with better diet quality, while lonely elderly male ones were in a worst situation[12]. Moreover, in our analysis, households with solitary adult females followed by solitary elderly male households presented the fastest fall in diet quality during this period.

Lower HDIr mean values were found for solitary males, specially the adult ones. The female presence seems to be important for the dietary quality, in line with previous studies[28,38]. One possible explanation for this lies in differences in women's shopping pattern, food choices[39] and ability to cook, characteristics that can enhance dietary quality. A recent study reporting determinants of dietary changes identified that marital status and baseline dietary habits as contributors to better dietary quality. Among women, better compliance to the recommended dietary pattern was achieved between those married and with worse baseline dietary habits[38]. Furthermore, women's concern with healthy food choices[40] and nutritional knowledge[41] can also contribute to improving dietary quality.

Our results showed that household location in rural areas was associated with better dietary quality for all household types. The better dietary scores for households located in rural areas may reflect a tendency to maintain socio-cultural food values[42]. In regards to elderly, their dietary patterns and quality seem to reflect their cultural heritage and life-course dietary imprints[40,43]. Furthermore, the location of the household may characterize household lifestyle, as well as, the socio-cultural context where choices are made, especially those related with health[44]. In addition, farming and social networking may reduce the cost of food and/or increase access to healthier food choices. Additionally, the better food behaviours noted in rural areas

may be related to the habit of eating at home, especially among the elderly[45]. Moreover, rural households may have a higher cooking frequency and, consequently, a better-quality diet, where cooking behaviour was indicated as a condition that may help elderly to have a better diet quality and live longer[46].

In our study, we also found that higher eating out expenses decreased diet quality. It seems that eating out results in poor habits being brought to the household. These results were also addressed by other authors[7,12,45]. Furthermore, a recent review[47] implicated eating out as a risk fator for higher energy and fat intake and lower micronutrient intake, all aspects of an unhealthy diet. Moreover, those that eat more outside home tend to shop in a different way and are also more likely to purchase ready-to-eat foods with lower nutritional value[45].

The positive effect of education found only in lonely elderly households is also described by Afonso (2012)[12]. Considering the resource availability it seems that preference for food is an important driver of dietary quality, as indicated for the elederly[28]. This may suggest that a growth in prosperity may disrupt the self-control which may lead to a lack of rationality in choices, a condition described by Offer (2006)[46] as the challenge of affluence.

Some of the available data on the Portuguese population described that the differences of the dietary patterns between households, including a comparison with data from other countries, were due to differences in sociodemographic fators[14-16,21,22]. The location of the household and the educational level of the household head were some of the fators previously related with household dietary availability[21,22], as shown in our results regarding dietary quality. Another study analysing empirically the main determinants of food expenses among elderly Spanish consumers found that household type (one person, couples and other different household composition that include elders), level of education and family income were significant predictors of diet quality[39].

Sociodemographic characteristics have been reported as important determinants for dietary availability[13-14,16,18] and for health and nutritional wellbeing[12,19,20]. Furthermore, changes in food and nutrient availability for the Portuguese have been reported[7-8,21-24]. The slightly higher diet quality among households with elderly members, present in our results, represents an interesting finding.

A previous review[49] conducted among the European adult population also indicated the existence of a less healthy nutrition pattern among those belonging to lower socioeconomic levels. However, in this paper we found an inverse association of educational level of the household head with lower diet quality, except for lonely elder household. This indicates that socioeconomic status did not influence positively the diet quality. In accordance to our findings, other studies also reported non-positive effect of resource availability on diet quality in China[50] and Europe[28]. Considering that, we may need to pay more attention to preference and/or socio-cultural food practices when designing dietary intervention.

The deep-reaching economic and social changes that Portugal has experienced in the last few decades have left their mark on households, namely the role of women in the labour market and the ageing of the population[1,33]. Moreover, the lifestyles of the households with elderly members are likely to be different from those without them. Income, social status and culture may be highlighted as universal dietary determinants, but their effects on diet are difficult to interpret. In the analysed groups dietary quality appears to be associated with sociodemographic aspects permeated by socio-cultural characteristics. Considering that, our findings address the importance of developing strategies to reinforce and preserve the cultural values associated with traditional diets, as suggested by Valagão (2002)[51]. The elderly´s expertise may be used as a tool to improve dietary quality in other age groups and introducing cooking traditional foods as part of a healthier and more pleasurable eating pattern.

The low but statistically significant relationships between dietary characteristics and sociodemographic variables that we found were also

identified by others[16,28], which is not unusual given the cross-sectional study design[28] and the sample size. The low effect sizes may be explained by the inter- and intra-individual variability present in food consumption[52]. The weak associations can also be related with the fact that the dietary information from the HBS refers to an indirect measure of dietary intake and the food availability data covering a limited period of time, which may not accurately reflect the typical dietary pattern[53].

The HBS food- and nutrient-derived data present limitations. The differences in the time periods of data collections between the surveys are not expected to impair comparisons because we present mean values derived from a representative sample which were collected over the year. Nevertheless, it may reduce the mean estimates for the food and beverages items rarely consumed in 1990. The HBS was not designed to assess dietary information and does not specify quality or quantity of food items consumed outside the household. However, households with elderly members eat out less often[45], so HBS-derived information for this group may more accurately reflect total household food availability. Notwithstanding this, we still have to consider that HBS-derived data does not have the capacity to access information on food losses and waste, food given to pets, meals offered to guests, uses of supplements and the presence of pregnant or lactating women in the household. The household food availability represents a gross measure once the amount of food is divided by the total number of household members. However, the stratification used here adjusted for, person, age and sex. Furthermore, comparisons of food and nutrient data derived from distinct sources of dietary data, namely the national food supply, household food availability from HBS and individual food consumption, showed agreement, indicating that the use of HBS-derived data is a valid option in the indirect assessment of Portuguese[23] and European food patterns[15,53]. Despite the limitations, dietary data from HBS has been used and recommended as indirect measure of food intake. Additionally, the dietary index derived from HBS can also be used to describe food patterns, dietary quality and its association with health situation[8,53]. At a national representative level, HBS-based data can provide nutritional information harmonised according to

standard procedures, which allows intra- and inter-country comparisons[34,35]. It seems reasonable to use these data for monitoring and comparing the food and nutrient availability among representative population samples in different time frames. These aspects are advantages of our study.

The diet characteristics available in Portuguese households are still poorly studied. The decreasing trend in dietary quality and its association with household characteristics identified in this study raises concern and calls initiatives to promote healthy diets. The differences in household composition and sociodemographic characteristics need to be addressed when designing nutritional public health intervention. Future studies should extend these findings by investigating potential mechanisms underlying the non-positive effect of resource availability on diet quality, especially between the elders.

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4.4 Artigo 4: Effect of sociodemographic variables and time on food group contribution to Portuguese elderlu household food availability

Submited for publication

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Abstract

Objective: To analyze the simultaneous effects of sociodemographic variables and time describe on each food group contribution to total Portuguese elderly household food availability.

Design: Four cross sectional Portuguese Household Budget Surveys were used. A multivariate analysis of variance (MANOVA), using a general linear model (GLM), was applied to analyze the simultaneous effects of sociodemographic variables and time.

Setting: Portuguese population.

Subjects: Nationally representative samples of households with members aged ≥ 65 years were selected and categorized as *solitary elderly female*, *solitary elderly male*, or *couple* (one elderly female and one elderly male). Samples included 1,967 households in 1989-1990, 2,219 households in 1994-1995, 2,533 households in 2000-2001 and 2,441 households in 2005-2006.

Results: The simultaneous effects of sociodemographic variables and time were significant for all food groups (P<0.001). The highest contribution for the total household food availability was found for cereals, potatoes, alcoholic beverages, non-alcoholic beverages and fruits were large. The effects were large for “household food availability” and medium for “elderly household

type", "urbanization degree", "income", "food expenses" and "eating out expenses". Solitary elderly male households had the highest proportion of cereals and alcoholic beverages, whilst solitary elderly female households had higher availability of milk/milk products and fruits. Households located in urban areas had higher contribution of milk/milk products while rural, had higher contribution of potatoes.

Conclusions: The simultaneous effect of the studied variables on food group contribution to total household food availability can be considered when addressing dietary recommendation for providing an insight into the motivations associated with food purchases.

Keywords: household food availability, elderly, Household Budget Survey, Portugal.

Introduction

The structures of diets have been changing worldwide[1,2]. The reported dietary profile reveals the worsening of the dietary quality and its relation with the burden of non-communicable diseases [3,4]. The consequences of this for health and survival have been documented as well as the relationship of nutrition on the transition from vulnerability to frailty and dependence[5,6]. Thus, the need for promoting health and nutrition well-being worldwide, calls for assessing, analysing and monitoring nutrition situations [7,8].

Portuguese dietary patterns have changed over the years. Both food availability studies and analysis of samples of free-living Portuguese individuals confirmed that Portugal´s dietary profile shifted from a traditional, southern European to a more Westernized, protein-rich diet[9,10,11].

Although dietary characterization has previously been examined for the Portuguese population using household budget surveys (HBS) food and nutrient derived-data, national level data for the elderly group at is still scare[12]. Dietary information derived from direct intake measures, which include studies using different methodologies, indicated that the elderly have an eating pattern that raises concerns, when compared to other population groups[9,13,14,15].

Different fators were correlated with elderly dietary characteristics. Living arrangements, cultural differences, socioeconomic status, household location, elderly concerns with illness and attitudes toward food, nutrition and health condition in the elderly may also affect their dietary patterns[16-22]. But doubts still remain on how these arrangements are structured.

The decreasing trend in Portuguese dietary quality raises concern and calls the need for identification of sub-groups at risk, such as the elderly. Thus, in order to promote healthy eating, it is essential to identify elderly food habits and to describe its determinants[23]. Given that, this study aim is to analyze the simultaneous effects of sociodemographic variables and time on each food group contribution to total Portuguese elderly household food availability.

Methods:

Study design and subjects

This study analyses data from the Portuguese Household Budget Surveys (HBS), cross-sectional surveys based on national representative population samples developed by the Portuguese National Statistics Institute (INE). The representativeness is obtained through a multiple stage technique where the primary units corresponded to the regions at the Nomenclature of Territorial Units for Statistics level II (NUTS 2). The second unit corresponded to the households in each area, based on the national Census[24-27].

We used data from the 1989-1990, 1994-1995, 2000-2001 and 2005-2006 HBS editions. The subjects for this analysis are households selected and categorized according to age (≥ 65 years)[28], sex and number of their members as follows: *solitary elderly female* households*; solitary elderly male* households*;* and *couple* households, composed of one elderly female and one elderly male. Thus it included 1,967 households in 1989-1990, 2,219 households in 1994-1995, 2,533 households in 2000-2001 and 2,441 households in 2005-2006.

Sociedemographic variables

The sociodemographic characteristics studied were: educational level of the household head (*illiterate/elementary*, from no formal education up to 6 years of formal education; *secondary* from 7 up to 12 years of formal education; and *higher*, bachelor degree, master and PhD), household urbanization degree (*rural*, *semi-urban* and *urban*), and location based on the Portuguese NUTS 2 regions (*North*, *Centre*, *Lisbon and Tejo Valley*, *Alentejo*, *Algarve*, *Azores* and *Madeira*). The household *per capita* income (Euro *per capita*/day), total *food expenses* (percentage contribution of food expenses in total household expenditures), and *eating out expenses* (percentage of total food expenses) were also included.

Dietary estimates

The HBS data contains each household's food acquisitions and expenses, obtained through a self registration diary of food items entering the household (purchased, home produced or received as gifts) during 7 days in 1989-1990 and 14 days in the other editions. Seasonal variability was considered once the data was collected during a 12-month period.

The household food availability data was open recorded into approximately 500 different codes and then categorized into food groups adjusting its definition from DAFNE food classification scheme[29,30] based on Rodrigues *et al*, (2007)[31]. The *per capita* daily food availability was estimated through the division of total household daily food availability by the household size. The food items were grouped into fourteen main food groups named[31]: *cereals* (cereal and cereal products), *meat/meat products* (meat, meat products and dishes), *fish/seafood*, *eggs*, *milk/milk products*, *added fats/oils*, *potatoes* (potatoes and other starchy roots), *pulses*, *nuts*, *vegetables*, *fruits*, *sugar/sugar products*, *non-alcoholic beverages* and *alcoholic beverages*.

The relative contribution of each food group to the total household food availability was calculated by the division of the amount acquired of each food group (expressed in weight, kg *per capita*/day) by the total food acquired for the household (kg *per capita*/day) multiplied per 100. The values are expressed as proportion (% of each food group in total household food availability kg *per capita*/day).

Statistical methods

Analytical procedures accounted for the sample design. Descriptive statistics included mean and standard error (SE). Spearman's correlation coefficient (ρ) was used to assess the degree of association between pairs of continues variables. A multivariate analysis of variance (MANOVA), using a general linear model (GLM), was applied to analyze the simultaneous effects of sociodemographic variables and time on the relative mean contribution of each food group in total household food availability. The fators analyzed in the model were "elderly household type", "educational level of the household

head", "survey years", "urbanization degree" and "location". Total household food availability, income, food expenses and eating out expenses appeared in the model as covariates. Since the household *per capita* income had a high value of the skewness, a log transformation was applied. We evaluated the effect size using the values of Pillai's trace partial eta squared (η^2). After computing Cohen's effect size index - $f = \sqrt{\frac{\eta^2}{1-\eta^2}}$, we used the qualitative definition of between-subject effects proposed by Cohen, J. (1988)[32], as shown in Table 1. This evaluation served to identify the overall adjusted importance of the analyzed variables. The interpretation should be taken as follows: when we say that there is a large effect size for a food group it means that the evaluated sociodemographic variables and time have a great influence on this food group relative contribution to total household food availability. All reported p-values were two-sided and were considered statistically significant at the 0.05 level. The statistical analysis was performed in IBM SPSS Statistics version 20.0.

Table 1: Criteria for the qualitative definition of the effect size.

ffect Size	Correspondent values	
	Cohen´s test[a] f	Partial eta squared values[b] η^2
Small	0.10	0.009
Medium	0.25	0.058
Large	0.40	0.137

a- Values of effect size proposed by Cohen, J. (1988)[34].

b- We used the cut points 0.035 and 0.100 for η^2 to divide the classifications of small and medium, and medium and large, respectively.

Results

Table 2 presents the mean values of the relative contribution of each food group to total Portuguese elderly household food availability. All food groups were significantly affected by the studied variables (P<0.001). Large effects

sizes were found for the contribution of cereals, potatoes, alcoholic beverages, non-alcoholic beverages and fruits. The contribution of milk/milk products, meat/meat products, fish/seafood, sugar/sugar products and pulses had medium effect sizes.

Table 2: Food group's relative contribution in total food availability (% of each food group in total food availability *per* person/day) in Portuguese Elderly households (*solitary elderly female*, *solitary elderly male*, and *couple* - composed of one elderly female and one elderly male). Portuguese Household Budget Surveys from 1990 up to 2005.

Food Groups	Mean (%)	SE	$\eta 2$[1]
Alcoholic beverages	6.08	0.10	0.154*
Cereals	17.82	0.11	0.200*
Eggs	0.72	0.01	0.019*
Fats/oils, added	3.30	0.04	0.023*
Fish/seafood	5.18	0.05	0.045*
Fruits	11.55	0.97	0.108*
Meat/meat products	7.33	0.06	0.066*
Milk/milk products	15.26	0.13	0.075*
Non-alcoholic beverages	8.03	0.11	0.109*
Nuts	0.14	0.01	0.008*
Potatoes	11.50	0.12	0.161*
Pulses	0.64	0.02	0.035*
Sugar/sugar products	2.63	0.04	0.035*
Vegetables	9.62	0.07	0.027*

*$P<0.001$

1-The effect size ($\eta 2$) is adjusted for elderly household type, educational level of the household head, household urbanization degree, household location and years; household food availability (kg per capita per day), log income (Euro *per capita*), food expenses (% food expenses in total household expenditures) and eating out expenses (% of total food expenses) also appeared in the model as covariates.

Covariates appearing in the model are evaluated at the following values: household food availability= 2.125 kg *per capita* per day; log income (in Euro per capita per day) = 0.95; Food expenses= 41.50 %; eating out expenses=13.45%.

Table 3 presents the effect of elderly household type and level of education of the household head in each food group relative contribution. Among the household types, solitary elderly male households had higher contribution of cereals and alcoholic beverages. We observed a medium effect size for the effect of the elderly household type. Looking at each food group, the alcoholic beverages stand out as the only food group with a medium effect size.

The households headed by higher educated people presented the highest mean values for the contribution of milk/milk products, non-alcoholic beverages, alcoholic beverages, eggs, and nuts. The overall effect size was small. Education had a stronger relationship with the contribution of eggs, fruits and non-alcoholic beverages.

Table 3: Mean values of food group's relative contribution in total food availability (% of each food group in total food availability *per* person/day) according to elderly household type and educational level of the household head in elderly households. Portuguese Household Budget Surveys from 1990 up to 2005.

Food Groups	Elderly household type							Educational level of the household head						
	Solitary elderly female		Solitary elderly male		Couple		η^2	Illiterate/Elementary		Secondary		Higher		η2
	Mean	SE	Mean	SE	Mean	SE		Mean	SE	Mean	SE	Mean	SE	
Overall Effect Size (η^2)				0.048*							0.005*			
Alcoholic beverages (%)	1.88	0.12	11.79	0.64	7.09	0.12	0.058*	6.18	0.10	4.62	0.36	6.55	0.72	0.001**
Cereals (%)	18.41	0.23	20.40	0.63	17.33	0.12	0.009*	18.39	0.12	12.56	0.28	10.74	0.44	0.001**
Eggs (%)	0.70	0.03	0.57	0.05	0.74	0.01	0.000	0.70	0.01	0.84	0.04	1.08	0.11	0.002*
Fats/oils, added (%)	3.22	0.09	2.75	0.17	3.39	0.05	0.000	3.39	0.05	2.43	0.11	2.30	0.15	0.000
Fish/seafood (%)	4.86	0.11	4.65	0.21	5.36	0.06	0.001**	5.12	0.05	6.00	0.19	5.28	0.37	0.000
Fruits (%)	13.44	0.22	10.06	0.42	10.99	0.11	0.010*	11.10	0.10	16.52	0.39	15.27	0.50	0.002*
Meat/meat products (%)	6.63	0.13	5.32	0.23	7.80	0.07	0.008*	7.32	0.06	7.66	0.22	6.84	0.34	0.001**
Milk/milk products (%)	18.13	0.29	15.71	0.69	14.13	0.14	0.010*	14.99	0.14	17.62	0.45	19.05	0.73	0.000
Non-alcoholic beverages (%)	9.22	0.24	8.28	0.52	7.56	0.12	0.001**	7.58	0.11	11.19	0.46	16.27	1.06	0.002*
Nuts (%)	0.11	0.02	0.15	0.07	0.15	0.02	0.000	0.14	0.01	0.07	0.01	0.32	0.10	0.000
Potatoes (%)	10.01	0.23	9.48	0.46	12.20	0.14	0.004*	11.89	0.12	7.77	0.33	5.10	0.50	0.001**
Pulses (%)	0.43	0.03	0.65	0.06	0.72	0.02	0.003*	0.67	0.02	0.37	0.04	0.30	0.06	0.000
Sugar/sugar products (%)	3.19	0.10	2.44	0.19	2.44	0.04	0.007*	2.69	0.04	1.97	0.19	2.22	0.21	0.000
Vegetables (%)	9.49	0.16	7.52	0.35	9.88	0.08	0.001**	9.63	0.08	9.90	0.27	8.39	0.36	0.001**

*P<0.001; ** P<0.05; Covariates appearing in the model are evaluated at the following values: household food availability= 2.125 kg *per capita*/day; log income (in Euro per capita/day) = 0.95; Food expenses= 41.50 %; eating out expenses=13.45%.

The relation between each food group contribution with the survey year and locality urbanization degree is presented in table 4. Over the years, the overall effect size was small. Higher variation in time was found for fruits, non-alcoholic beverages and potatoes. Households located at urban areas had a higher contribution of milk/milk products, fruits, non-alcoholic beverages and fish/seafood; while at semi-urban areas there was a higher contribution of alcoholic beverages and at rural areas higher values for the other food groups, except for meat/met products (P>0.05). A medium effect size was found. Larger distinctions between the urbanization degrees were found for potatoes, cereals and milk/milk products.

Table 5 presents the mean values of each food group relative contribution according to Portuguese regions. Differences were found between the Portuguese regions for all food groups, except for sugar/sugar products (P>0.05). Also in this case we found a small overall effect size. Nevertheless, alcoholic beverages (higher availability in the North and Centre and lower availability in Madeira), potatoes (higher availability in the Centre and lower availability in Alentejo) and fruits (higher availability in Lisbon and Tejo Valey and lower availability in Azores and Madeira) showed higher relation with the Portuguese regions.

We observed that those with larger income purchase more food (ρ= -0.112, P<0.001), use a lower fraction of their budget on food expenses (ρ= -0.494, P<0.001), and spend larger amount of their budget on eating out expenses (ρ= 0.314, P<0.001). Elderly households that buy more food, had higher proportion of expenses in food items (ρ= 0.192, P<0.001) and spend lower fraction of their food expenses in eating out (ρ= -0.110, P<0.001). The percentage of outside food expenses in total food expenses is not significantly related with the proportion of food expenses in the total household expenses (ρ= -0.004, P=0.667).

Table 6 presents the adjusted effect for the analyzed covariates. A large effect was found for the household food availability, with significant association found in each food group relative contribution except for added fats/oils and nuts. A medium effect size was observed for the relative

Table 4: Mean values of food group's relative contribution in total household food availability (% of each food group in total food availability *per* person/day) according to survey years and locality urbanization degree in elderly households. Portuguese Household Budget Surveys from 1990 up to 2005.

Food Groups	Survey years									Locality urbanization degree						
	1990		1995		2000		2005		η2	Urban		Semi-Urban		Rural		η2
	Mean	SE	Mean	SE	Mean	SE	Mean	SE		Mean	SE	Mean	SE	Mean	SE	
Overall Effect Size (η^2)									0.018*							0.035*
Alcoholic beverages (%)	7.98	0.24	6.11	0.18	5.50	0.19	4.75	0.17	0.003*	4.82	0.12	7.76	0.24	7.02	0.20	0.005*
Cereals (%)	19.01	0.24	18.40	0.20	17.31	0.20	16.50	0.24	0.002*	15.50	0.15	19.52	0.23	20.61	0.21	0.013*
Eggs (%)	0.82	0.03	0.80	0.02	0.67	0.02	0.58	0.3	0.005*	0.74	0.02	0.63	0.03	0.75	0.02	0.001*
Fats/oils, added (%)	3.93	0.10	3.35	0.07	3.11	0.08	2.82	0.09	0.000	3.11	0.06	3.47	0.08	3.52	0.09	0.001**
Fish/seafood (%)	4.35	0.09	5.39	0.08	5.49	0.12	5.48	0.11	0.001**	5.56	0.08	5.02	0.10	4.64	0.09	0.002*
Fruits (%)	10.65	0.21	10.40	0.17	12.54	0.19	12.71	0.21	0.008*	13.71	0.14	9.85	0.20	9.06	0.17	0.010*
Meat/meat products (%)	6.32	0.11	8.00	0.12	7.40	0.11	7.53	0.14	0.001**	7.41	0.08	7.29	0.12	7.22	0.12	0.000
Milk/milk products (%)	12.76	0.25	14.64	0.24	16.46	0.25	17.21	0.29	0.003*	17.50	0.18	13.85	0.28	12.39	0.23	0.013*
Non-alcoholic beverages (%)	6.21	0.19	6.18	0.18	8.87	0.22	11.09	0.27	0.008*	10.08	0.17	6.46	0.20	5.62	0.17	0.008*
Nuts (%)	0.12	0.03	0.13	0.02	0.10	0.01	0.22	0.04	0.001	0.12	0.01	0.06	0.01	0.25	0.04	0.004*
Potatoes (%)	14.39	0.27	13.29	0.22	9.98	0.21	8.00	0.19	0.008*	9.00	0.14	12.95	0.26	14.66	0.24	0.016*
Pulses (%)	0.83	0.05	0.72	0.03	0.61	0.03	0.39	0.02	0.001**	0.42	0.02	0.76	0.04	0.93	0.04	0.006*
Sugar/sugar products (%)	3.61	0.11	2.60	0.06	2.35	0.06	1.98	0.08	0.006*	2.18	0.05	3.10	0.10	3.10	0.08	0.006*
Vegetables (%)	8.96	0.15	9.96	0.14	9.31	0.14	10.23	0.17	0.001**	9.57	0.10	9.16	0.16	10.06	0.15	0.003*

*P<0.001; ** P<0.05; Covariates appearing in the model are evaluated at the following values: household food availability= 2.125 kg per capita per day; log income (in Euro per capita per day) = 0.95; Food expenses= 41.50 %; eating out expenses=13.45%.

Table 5: Mean values of food group's relative contribution in total household food availability (% of each food group in total food availability *per* person/day) according to Portuguese Regions in elderly households. Portuguese Household Budget Surveys from 1990 up to 2005 survey years.

Food Groups	Portuguese Regions														η2
	North		Centre		Lisbon and Tejo Valley		Alentejo		Algarve		Azores		Madeira		
	Mean	SE	Mean		Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	
Overall Effect Size (η^2)								0.023*							
Alcoholic beverages (%)	8.72	0.22	7.51	0.24	4.23	0.13	3.14	0.22	4.13	0.33	2.99	0.52	1.49	0.42	0.031*
Cereals (%)	17.28	0.19	18.83	0.24	15.60	0.17	22.70	0.39	19.10	0.47	20.82	1.03	27.15	1.49	0.012*
Eggs (%)	0.70	0.02	0.60	0.02	0.74	0.02	0.96	0.06	0.65	0.05	1.00	0.12	0.82	0.20	0.004*
Fats/oils, added (%)	3.12	0.08	3.53	0.11	3.08	0.06	4.04	0.16	3.88	0.16	2.57	0.23	2.71	0.29	0.004*
Fish/seafood (%)	5.27	0.10	4.61	0.09	5.71	0.10	4.06	0.14	6.68	0.24	3.85	0.36	3.33	0.43	0.006*
Fruits (%)	9.72	0.17	10.22	0.20	14.19	0.18	11.52	0.30	12.63	0.40	8.03	0.72	8.22	0.74	0.017*
Meat/meat products (%)	8.19	0.12	6.92	0.13	7.45	0.10	6.65	0.19	5.91	0.22	5.15	0.46	5.11	0.53	0.009*
Milk/milk products (%)	14.01	0.24	13.55	0.29	16.53	0.21	17.35	0.43	15.26	0.52	24.43	1.30	16.17	1.31	0.007*
Non-alcoholic beverages (%)	7.29	0.20	6.24	0.21	8.95	0.19	9.85	0.41	10.98	0.55	10.90	1.08	5.57	0.83	0.012*
Nuts (%)	0.20	0.04	0.17	0.02	0.10	0.01	0.06	0.01	0.12	0.03	0.06	0.03	0.07	0.04	0.001**
Potatoes (%)	12.89	0.24	14.06	0.27	9.91	0.17	7.59	0.30	8.52	0.36	8.91	0.80	13.92	1.25	0.020*
Pulses (%)	0.59	0.04	0.86	0.04	0.53	0.02	0.68	0.05	0.65	0.06	0.79	0.16	0.22	0.08	0.002**
Sugar/sugar products (%)	2.54	0.08	2.80	0.09	2.40	0.06	3.10	0.14	2.42	0.15	4.45	0.48	3.32	0.42	0.001
Vegetables (%)	9.34	0.14	9.95	0.16	10.28	0.13	7.91	0.23	8.79	0.32	5.66	0.45	11.71	0.87	0.009*

*P<0.001; ** P<0.05; Covariates appearing in the model are evaluated at the following values: household food availability= 2.125 kg *per capita* /day; log income (in Euro *per capita*/day) = 0.95; Food expenses= 41.50 %; eating out expenses=13.45%.

Table 6: Adjusted mean values of food group's relative contribution in total household food availability (% of each food group in total food availability *per* person/day) in the households with elders. Portuguese Household Budget Surveys from 1990 up to 2005.

Food Groups	Household food Availability (kg/*per capita* / day)		Per Capita Income (log income/day in Euros)		Food expenses (% household expenses)		Eating out expenses (% total food expenses)	
	β^a	η^2	β^a	η^2	β^a	η^2	β^a	η^2
Overall Effect Size (η^2)		0.179*		0.055*		0.060*		0.057*
Alcoholic beverages (%)	1.374	0.025*	0.710	0.000	0.055	0.007*	-0.006	0.000
Cereals (%)	-2.772	0.087*	-6.629	0.013*	-0.009	0.000	0.013	0.001**
Eggs (%)	-0.046	0.002*	0.109	0.000	-0.001	0.000	-0.003	0.001*
Fats/oils, added (%)	-0.031	0.000	-0.273	0.000	0.023	0.005*	-0.013	0.003*
Fish/seafood (%)	-0.629	0.017*	3.148	0.010*	0.045	0.015*	-0.035	0.013*
Fruits (%)	-0.631	0.005*	5.403	0.009*	-0.040	0.004*	0.017	0.001**
Meat/meat products (%)	-0.656	0.014*	4.658	0.017*	0.069	0.025*	-0.056	0.025*
Milk/ milk products (%)	-0.428	0.001*	-0.767	0.000	-0.077	0.007*	0.055	0.006*
Non-alcoholic beverages (%)	1.711	0.030*	0.264	0.000	-0.060	0.006*	0.069	0.013*
Nuts (%)	-0.013	0.000	0.244	0.001*	0.001	0.000	-0.001	0.000
Potatoes (%)	2.369	0.053*	-7.813	0.014*	-0.16	0.000**	0.000	0.000
Pulses (%)	0.095	0.004*	-0.100	0.000	0.005	0.001*	-0.003	0.001**
Sugar/ sugar products (%)	-0.137	0.001*	-0.547	0.001**	-0.004	0.000	0.004	0.000
Vegetables (%)	-0.236	0.001*	1.541	0.001*	0.007	0.000	-0.041	0.009*

*P<0.001; ** P<0.05; The effect size (η2) is adjusted for elderly household type, educational level of the household head, household urbanization degree, household location and years; household food availability (kg *per capita*/day), log income (Euro *per capita*), food expenses (% food expenses in total household expenditures) and eating out expenses (% of total food expenses) also appeared in the model as covariates.

Household with β % more (adjusted) relative contribution of the respective food group have: a) 1 kg more of food availability or; b) a 10 times greater income (a 2.33% bigger income is related with a β 100 increase in the relative contribution of the food group) or; c) 1% more of food expense or: d) 1% more of eating out expenses.

contribution of cereals, with a larger contribution being present in households with less food availability. We also found a medium effect size for the relative contribution of potatoes, more present in the households with higher food availability. Households with larger incomes had higher relative contributions in the household food availability from: fruits, meat/meat products, fish/seafood, vegetables and nuts. Potatoes, cereals and sugar/sugar products were negatively correlated with income. Income had a medium overall effect size, with higher effect found for meat/meat product, potatoes and cereals. Households with higher proportion of food expenses had larger contributions from meat/meat products, alcoholic beverages, fish/seafood, added fats/oils and pulses, and lower contributions from milk/milk products, non-alcoholic beverages, fruits and potatoes. There was an overall medium effect size of the proportion of food expenses in the representativeness of the food groups, with higher effect sizes observed in the relative contribution of meat/meat products and fish/seafood to total household food availability. The proportion of eating out expenses also had a medium effect size in the representativeness of the food groups, with higher effect sizes present for meat/meat products, fish/seafood and non-alcoholic beverages. Households that spent a higher proportion of their income on eating out expenses showed larger contribution of non-alcoholic beverages, milk/milk products, fruits and cereals and lower contributions from meat/meat products, vegetables, fish/seafood, added fats/oils, eggs and pulses in total household food availability.

Discussion

Overall, four food groups, cereals, milk/milk products, fruits and potatoes, represented 55.63% of the food available inside the Portuguese elderly households. Elderly Europeans also reported large availability of milk/milk products and fruits[33]. Considering the simultaneous effects of the studied sociodemographic variables and time, the most relevant effects were observed on cereals, potatoes, alcoholic beverages followed by non-alcoholic beverages and fruits.

The adjusted measures presented here give us clues about how the elderly household food availability changes according the presence of each analyzed fator. The effects were large for household food availability and medium for elderly

household type, urbanization degree, income, food expenses and eating out expenses. Similar to us, few other studies particularly addressed the determinants of elderly diet quality[34] and food acquisition pattern[35].

Solitary elderly male households had the highest proportion of alcoholic beverages, results also found previously[12,14,36]. The contribution of this item was almost twelve times higher than the contribution found for the solitary elderly female households. Furthermore, it seems that Portugal remains among the European countries with the highest alcoholic availability, although a reduction in the alcoholic beverages availability in Portuguese households has been reported[10,31,37]. The social and cultural aspects of alcohol consumption and the maintenance of a habit acquired by men during their life[22,36,38,39] may explain our findings.

We found that solitary elderly female households had higher availability of milk/milk products, fruits and non-alcoholic beverages. These results may exemplify the gender preferences for some food items. Other studies[35,40,41] also reported gender differences in the intake of fruits and vegetables among older adults. Elderly women concern with health and nutrition may have contributed for the higher food availability of the cited items[34,39]. However, the contribution of milk/milk products can increase fat intake[9]. Furthermore, the high availability of non-alcoholic beverages and the growing importance of soft drinks availability in European Countries were correlated with imbalanced dietary profile[42].

Elderly households with higher income acquired a larger proportion of meat/meat products, fruits and fish/seafood and lower proportion of cereals and potatoes. Hence, income is related with food choices, reinforced with the social value attributed to some foods[35,43].

We observed that households that have higher food expenses purchased larger percentage of meat/meat products, alcoholic beverages and fish/seafood, usually more expensive food items. They also bought smaller proportion of milk/milk products, non-alcoholic beverages and fruits. This occurrence may be related to affluence which allows the acquisition of food items previously inaccessible[34,44], such as meat. Although expensive, meat seems to be a product of interest for the

Portuguese, as shown by comparison of the availability of this item in other European Countries[10,31,45].

Those households with higher eating out expenses presented higher contribution of non-alcoholic beverages, milk/milk products, fruits and cereals to total household food availability. It is interesting to notice that those products are easy to eat and may not require sophisticated cooking procedures. The dietary pattern observed can be unbalanced, which was in fact found in Portuguese households dietary quality[19,37]. Furthermore, it seems that for all ages and in different countries, eating out results in poorer dietary quality[46], issue also observed in Portuguese elderly[47]. Considering elderly individuals, the loss of the ability to cook and loneliness[18,22,48,49] may also help to increase the contribution of ready to eat foods.

The general linear model showed weak, but statistically significant effects on the relative contribution of each food group in total food availability. Similar magnitudes of the associations were also found by previous analysis of HBS dietary data[45,35].

The HBS dietary data, an indirect measure of dietary intake, and the limited period of time covered by the HBS may not accurately reflect the usual dietary pattern[50,51]. However, when compared to individual data, good results were found[53]. As disadvantages of HBS dietary data we can point out the fact that one cannot determine the fraction of food acquired that was not consumed (e.g., loss, waste, fed to pets) and the non-specification of the consumption of food and beverages outside the household. But elderly have less eating out expenses[52]. Furthermore, elderly Portuguese individuals in urban and rural areas have coverage of home care services, including the provision of meals, which may affect measures of household food availability by HBS surveys.

The HBS dietary data allows the description of food and nutritional information with national representativeness in various formats and levels of detail[33,51]. Furthermore, there is a good correlation of dietary data from HBS with direct measures of food intake[52,54]. The dietary information presented here refers to nationally representative samples of the elderly households, as a population sub-

group. The results serve the purpose of monitoring trends in food availability over time, both within and between countries.

Additionally, the simultaneous effect of sociodemographic variables and time on the relative contribution of each food group to the total household food availability providing reliable information for the development of food based intervention designed in a life course approach[55]. Another advantage of our study has to do with the food information presented, which provided interesting insight into the influences associated with food acquisitions, reflecting food choices motivations. Furthermore, it reinforced the importance of considering such variables when addressing nutritional and health interventions. Complementary, in the future, the nutrient contribution can be analyzed, as recommended and performed by others[56,57].

As recommended by the Position of the American Dietary Academy[23], actions directed to ensure successful aging and minimize the effects of disease and disability need to incorporate a wide range of flexible dietary based recommendations and, culturally sensitive food and nutrition directions as part of the underlined actions. Our results gives that and can be useful for developing food based strategies about eating behavior and targeting the communication of nutrition and health messages, particularly those related to food and aging[23,58].

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5. Conclusões

5.1 Principais achados e suas repercussões

Anterior a presente investigação, apenas um estudo havia utilizado os inquéritos aos orçamentos familiares, edição de 1990-1991, para especificamente reportar a disponibilidade alimentar e nutritional de agregados domésticos privados Portugueses com idosos[107]. A revisão da literatura identificou disponibilidade *per capita* média de grupos alimentares, de energia e de nutrientes como os indicadores mais empregues. A estatística descritiva e análise de padrão alimentar através de índices de qualidade da dieta foram os métodos analíticos mais usados pelos estudos que descreviam a disponibilidade alimentar e nutricional dos domicílios portugueses.

Os dados obtidos a partir da revisão, serviram para direccionar a condução dos demais estudos da presente tese de doutoramento. Neste sentido, os estudos desenvolvidos preenchem a lacuna quanto à descrição da situação alimentar e nutricional de idosos empregando, além de métodos estatísticos descritivos, análises mais complexas. A análise de variância multivariada (MANOVA), empregando um modelo linear geral (GLM) estudou os efeitos simultâneos das variáveis sociodemográficas e do tempo sobre a contribuição relativa de cada grupo de alimentos no total de alimentos disponíveis nos domicílios com idosos.

Resultados das estimativas da disponibilidade alimentar e nutricional no período estudado, de 1995 a 2005, para os agregados domésticos privados portugueses com idosos revelaram redução na disponibilidade alimentar. Apesar do aumento do gasto alimentar fora do domicílio, especialmente entre os idosos solitários, os idosos parecem ainda manter algum consumo alimentar em suas casas, dado também apresentado por outros estudos[90-92]. Convém comentar que, as repercussões do hábito de comer fora de casa têm sido associadas a uma pior qualidade nutricional da dieta[152], uma vez que tem sido associada ao consumo de alimentos com baixa densidade nutricional[71] e ocorrência de obesidade[153]. O aumento do valor energético e do conteúdo de gordura e redução do conteúdo de

micronutrientes tais como a vitamina C e o ferro da dieta figuram entre os desequilíbrios nutricionais relacionados com o hábito de comer fora de casa[152].

A disponibilidade alimentar, expressa pela quantidade per capita média de grupos alimentares, revelou redução de cereais, óleos/gorduras de adição, batatas e açúcar/produtos açucarados. Por outro lado, observou-se um aumento na disponibilidade de leite/produtos lácteos, frutas, água mineral, sumos de frutas/hortícolas e refrigerantes. Estes itens, de fácil preparação, podem refletir a baixa disposição e/ou condição destes indivíduos para prepararem refeições mais elaboradas. Para além disto, também podem indicar uma menor variação de itens alimentares disponíveis no domicílio, fato que pode contribuir para a monotonia alimentar e desequilíbrio na qualidade da dieta.

A análise da evolução da disponibilidade de um item alimentar tem servido para identificar tendências e os possíveis motores deste comportamento, resultados que nos auxiliam no entendimento do fenómeno alimentar e nutricional de populações. O crescimento do consumo das carnes serve de exemplo.

Em Portugal, diferentes estudos revelam que o consumo[97] e a disponibilidade[79,154] das carnes vêm apresentando crescimento. Este padrão tem sido associado inversamente ao nível de escolaridade no que se refere ao consumo[97] e positivamente no que se refere à disponibilidade deste item nos agregados chefiados por indivíduos com maior nível de escolaridade[75]. Aponta-se a melhoria das condições de acesso a este alimento[97], a expansão de uma demanda reprimida[154], o "valor" atribuído a este alimento como fatores que se associam a esta ocorrência. No cenário mundial, as questões culturais, em particular aquelas relacionadas à substituição dos produtos de origem vegetal por produtos de origem animal[155] também vêm sendo apontadas como fatores relacionados com a tendência de consumo deste item.

De uma forma geral, os resultados da disponibilidade alimentar e de nutrientes revelaram diferenças consoante aos tipos de agregados com idosos. Os domicílios de casais de idosos apresentaram os maiores valores médios para nove entre os 14 grupos alimentares analisados. Parece que a presença de outra pessoa possa favorecer a uma maior variabiliadde alimentar no interior destes domicílios. A presença feminina parece também influenciar, fato discutido em outros estudos

nos quais apontam a maior preocupação feminina com questões de alimentação e saúde como definidores das escolhas alimentares[123,156]. A intimidade feminina com a seleção e preparação de alimentos e o seu papel social no que se refere à alimentação também podem ser apontadas como características relacionadas com melhores escolhas alimentares. Os resultados obtidos relativamente às diferenças associadas à disponibilidade de alimentos nos agregados das idosas e dos idosos solitários de alguma forma reportam isto. Observamos que as idosas solitárias apresentaram maior disponibilidade de frutas e hortícolas, resultados semelhantes aos encontrados por outros estudos[123, 157]. Por outro lado, a maior disponibilidade de bebidas alcoólicas nos domicílios dos idosos solitáros refletem, de alguma forma, a manutenção de hábitos culturais enraizados (consumo de álcool como parte da cultura mediterrânica), resultados em consonância aos encontrados por outros estudos[108,109]. A situação de maior isolamento e solidão destes indivíduos também pode ser apontada como provável característica associada a maior disponibiliade de bebidas alcoólicas nos domicílios dos idosos solitários. Resultados de um estudo espanhol também revelaram que as características do padrão de gasto entre domicílios com idosos se associam às características sociodemográficos e de composição do domicílio[158].

As alterações da composição de energia e de nutrientes observadas ao longo do tempo, nomeadamente, a redução da energia total da dieta e da contribuição dos hidratos de carbono e, aumento da contribuição das proteínas e ácidos gordos saturados assinalam características que comprometem a qualidade da dieta disponível nos domicílios com idosos. As mudança mudanças no perfil da dieta[23], para uma dieta mais rica em gordura, alimentos de origem animal, especialmente as carnes, e pobre em hidratos de carbono e fibra, juntamente com a inatividade física imposta pelo modo de vida urbano e moderno, traz efeitos indesejáveis para o estado nutricional e de saúde. Estas repercussões vêm sendo amplamente estudadas e sinalizam a necessidade de tomada de medidas tanto no que se refere à identificação dos fatores propulsores como na busca de soluções ajustadas às características do grupo sob análise.

Os resultados da análise da qualidade da dieta revelaram que as famílias portuguesas com idosos apresentam baixa qualidade da dieta. No entanto, a

frequência de inadequação da qualidade da dieta foi ainda maior entre os domicílios com adultos. Entre os agregados com idosos, os coeficientes ajustados para o ano de pesquisa, nível de escolaridade do chefe de família, e gastos com o consumo fora de casa se associaram inversamente com o índice de qualidade da dieta enquanto a localização do domicílio em área semi-urbana e rural estimaram valores mais elevados. Exceções foram encontrados nos domicílios dos idosos solitários, onde o nível de escolaridade do chefe de família se associou positivamente com os valores do índice de qualidade da dieta. A predição de valores de qualidade de dieta mais altos para os agregados com idosos, especialmente nos locais com menor urbanidade, pode indicar a força com que se mantêm nestas localidades aspectos sócio culturais que podem estar a contribuir para a qualidade da dieta. A preparação e o consumo alimentar nos domícilios, aspecto frequente entre os mais velhos, especialmente naqueles que vivem mais longe dos centros urbanos, podem ser fatores que contribuem para aumentar a qualidade da dieta. Estes resultados evidenciam a maior precariedade das características alimentares dos domicílios de isosos solitários, sobretudo auqles com menor nível socioeconómico.

A situação de piora da qualidade da dieta evidencia problema que precisa de intervenção. Os resultados de melhor qualidade da dieta entre os agregados com idosos localizados em zonas rurais, podem servir de pista para algumas das recomendações que se fazem pertinentes tendo em vista a manutenção e/ou melhoria da qualidade de dieta. Isto porque nas zonas menos urbanizadas a selecção, preparo e consumo de alimentos se faz muito mais no âmbito privado do domicílio. Neste cenário o comer em casa se faz mais frequente bem como o hábito de preparo dos alimentos e a partilha das refeições. Assim, iniciativas voltadas para o estímulo à manutenção do hábito da preparação e consumo de alimentos no interior do domicílio pode ser uma alternativa interessante. Esta recomendação encontra-se em consonância com resultados de um estudo de coorte desenvolvido entre idosos de Taiwan[159]. Os resultados desta investigação revelaram associação positiva entre o hábito de cozinhar e a maior sobrevivência[159]. Neste sentido, é necessário ter em conta o impacto deste resultado para a importância de se estimular a manutenção do hábito de se preparar alimentos e/ou comer em casa,

especialmente no que concerne àqueles pratos elaborados consoante a cultura alimentar mediterrânica. Entretanto, para que sejam desenvolvidas acções que efectivamente redireccionem esta prática é necessário pesquisar os valores simbólicos atribuídos a determinados grupos de alimentos, tais como as hortaliças e as carnes, e também a preparação alimentar. Como discutido por Canesqui *et tal* 2005[160] existe a necessidade de se explorar as várias perspectivas da alimentação incluindo o comer e a preparação de alimentos, em busca de uma superação das fronteiras disciplinares na abordagem das relações entre o homem e sua comida.

Resultados da associação entre a disponibilidade alimentar dos agregados domésticos privados portugueses com idosos com suas características sociodemográficas revelou efeitos simultâneos significativos na contribuição dos itens alimentares para o total de alimentos nos domicílios. Considerando as possíveis motivações associadas à compra de alimentos podemos sugerir que a maior disponibilidade de batatas nos domicílios localizados no meio rural pode estar associada a um maior grau de preparo alimentar. Por outro lado, a maior disponbilidade de leite/produtos lácteos nos domicílios urbanos (alimentos de fácil consumo que em sua maioria não exigem preparo) pode estar relacionda a uma menor disponiblidade de preparar refeições. Neste sentido, os efeitos das variáveis sociodemográficas sobre a composição de itens alimentares disponíveis no domicílio podem ser considerados para a construção de medidas de intervenção. A eleição dos itens alimentares a serem promovidos tendo em vista a melhoria da qualidade da dieta pode pautar-se, inicialmente, nas preferências alimentares aqui identificadas.

Os resultados apresentados podem ser empregues na construção de políticas nutricionais e de saúde especificamente direcionadas aos idosos. A tendência de queda na qualidade da dieta e sua associação com características domiciliares identificados neste estudo é preocupante e exige iniciativas para promover dietas mais saudáveis. As diferenças na disponibilidade alimentar e sua associação com as características sociodemográficas dos domicílios precisam ser abordadas na estruturação de intervenções de nutrição em saúde pública. O foco nos alimentos parece ser uma abordagem interessante e prioritária. Um verdadeiro rertorno ao

princípio: o alimento e as formas de seleciona-lo e prepara-lo no contexto domiciliar. O incentivo ao aumento da disponibilidade de alimentos tradicionais, tais como pescado e leguminosas, integrantes do património cultural alimentar Português podem ser incorporados nas mensagens focadas na melhoria da qualidade alimentar. A facilidade da seleção e preparo do item alimentar também devem ser consideradas. Neste sentido, dicas quanto às combinações de alimentos deveriam ir para além das questões nutricionais[166].

A apresentação de dados longitudinais de Portugal sobre a disponibilidade alimentar no interior dos domicílios com idosos retrata um tema prioritário para o país e para Comunidade Europeia, conforme referido em diversos documentos[161-164]. A identificação conjunta dos fatores sociodemográficos associados às escolhas dos alimentos disponíveis nestes domicílios reportada nesta investigação representa informação valiosa para a construção de medidas de intervenção. Esta recomendação assenta no fato de que os fatores ambientais, nos quais se incluem as características sociodemográficas, se apresentam como importantes propulsores das inadequações de saúde e nutrição[165]. Ou seja, medidas de intervenção poderão ser desenhadas à luz das características dos agregados e da sua localização[166], de entre outras peculiaridades, conforme recomendado por medidas de intervenção bem sucedidas[167-169].

Ações complexas abrangendo diversos determinantes das condições nutricionais e de saúde vem sendo o foco das intervenções de nutrição em saúde pública. Aquelas que são mais bem sucedidas são as que se adaptam a realidade do contecto local. Considerando os idosos, a manutenção e o aumento da capacidade funcional destes indivíduos têm sido reportados como enfoques prioritários. Neste sentido, a abordagem perante a perspectiva de curso de vida parece ser essencial para a prevenção e controle de doenças não transmissíveis[167]. Aspectos como favorecimento ao acesso e ao consumo de hortícolas, intervenções no âmbito domiciliar e o aproveitamento das infraestruturas existentes estão entre as características presentes nas intervenções com resultados positivos entre os idosos[167]. Recentemente uma revisão escocesa identificou o incentivo a uma alimentação num contexto mais social, o desenvolvimento de ações educativas em

saúde pública e o estímulo para atividades coordenadas entre indivíduos mais velhos como medidas de intervenção recomendadas[168]. As ações educativas isoladas e/ou associadas a programas de intervenção mais complexos, também são apontadas por outros estudos[169] como estratégias eficazes para a melhoria da qualidade da dieta e da função física, tendo impacto inclusive na redução da depressão entre os idosos com mais de 65 anos de idade que vivem em comunidade[169]. Para além destas considerações, o envolvimento e participação ativa dos idosos parece ser determinante ímpar para o sucesso da intervenção de nutrição e saúde para este público[170].

Tendo em vista tais considerações, as informações sobre a disponibilidade alimentar e nutricional dos idosos portugueses e a sua associação com as características sociodemograficas resultantes da presente investigação oferecem informações de incontestável importância para o desenho de estratégias de nutrição em saúde pública para os idosos de Portugal.

5.2 Considerações metodológicas e investigação futura

O tipo de estudo, transversal, identifica as características e possíveis relações de interesse. Tendo em vista que a base de dados apresenta informações sociodemográficas, também foram descritas as relações entre as características de interesse com as demais variáveis. Entretanto, vale destacar que não podem ser identificadas as relações temporais entre causa e efeito[171,172]. Como os dados analisados advêm da análise de quatro edições dos inquéritos aos orçamentos familiares desenvolvidos entre 1990 e 2006, a tendência temporal tanto das características da dieta como das associações investigadas no período citado também foram descritas.

O uso das bases de dados dos inquéritos aos orçamentos familiares reveste-se da vantagem de se otimizarem os recursos disponíveis. A representatividade populacional e o fato de serem desenvolvidas em intervalos regulares podem ser apontadas como grandes vantagens. Entretanto, os dados alimentares e nutricionais provenientes dos inquéritos aos orçamentos familiares apresentam limitações.

Neste sentido, deve-se atentar às considerações metodológicas dos inquéritos tendo em vista a garantia da qualidade do dado e o seu uso pleno, dentro das suas potencialidades. Procedimentos empregues na harmonização dos dados dos alimentos, atenção ao desenho do estudo através do uso de ponderadores nas análises, ajustes das variáveis de interesse através do uso de indicadores, como os de qualidade da dieta (que servem para identificar padrões) e estratificação dos grupos de interesse, estão entre alguns dos cuidados tomados para a caracterização da disponibilidade alimentar e determinação dos padrões alimentares. Por exemplo, o fato destes estudos serem obtidos através de amostras representativas da população inclui um peso ou um conjunto de pesos para ajustar probabilidades desiguais de seleção no desenho da amostra. Daí advém a necessidade de serem empregues na análise os ponderadores para ajustar estes aspectos. O uso de diferentes metodologias na análise também pode potenciar o emprego destas bases de dados. A inclusão da estratificação dos domicílios com idosos levando-se em conta a sua composição em termos de dimensão e sexo, possibilitou detalhar a situação destes agregados sob um olhar mais pautado nos indivíduos. Isto porque, com este procedimento, conseguimos retratar características dos domicílios de isosos e idosas solitárias, bem como casais de idosos, mesmo partindo de uma investigação que retrata o domicílio como unidade de análise principal. O uso do indicador contribuição do item alimentar para o total de alimentos no domicílio e a análise do efeito conjunto das variáveis sociodemográficas estudadas sobre a disponibilidade alimentar, podem ser consideradas como vantagens da presente investigação. Considerando esta perspectiva, apurou-se a "importância do item" em relação ao total de alimentos disponíveis no domicílio bem como o efeito

A não identificação dos alimentos consumidos fora do domicílio constitui uma das principais limitações dos inquéritos aos orçamentos familiares. Isto porque para a maioria dos alimentos não há indicação precisa do tipo e da quantidade de alimentos e bebidas adquiridos. No caso dos idosos, o menor gasto alimentar fora do domicílio[90-92] de alguma forma pode minimizar uma das limitações mais importantes dos dados alimentares e nutricioais originados dos inquéritos aos orçamentos familiares. Para além desta limitação, também se pode citar o fato de

não serem descritos os alimentos perdidos, fornecidos a animais e/ou refeições e alimentos oferecidos a hóspedes, uso de suplementos vitamínicos e minerais[106].

Convém destacar que as estimativas alimentares e nutricionais calculadas a partir de dados dos inquéritos aos orçamentos familiares devem levar em consideração o desenho amostral, cuidado metodológico que serve para ajustar adequadamente as estimativas calculadas. Seguindo recomendações[149], apresentam-se na presente investigação a "magnitude da incerteza" das estimativas, ou seja, do valor médio e do erro padrão associado às estimativas calculadas. Embora a magnitude das associações encontradas no nosso estudo tenha sido baixa, o significado estatístico serviu para identificar as características correlacionadas com o perfil da dieta, bem como itens alimentares e variáveis sociodemográficas de maior importância para os domicílios com idosos.

As características alimentares e nutricionais da população portuguesa idosa ainda são pouco estudadas. Futuros estudos devem estender estes resultados, investigando possíveis mecanismos subjacentes aos determinantes sociodemográficos relacionados à disponibilidade alimentar e qualidade da dieta. A continuidade da análise dos dados dos Inquéritos aos orçamentos familiares entre os idosos e o reforço às análises das questões de acesso ao alimento, custo de alimentação saudável e o impacto destas escolhas no orçamento familiar constituem temas que merecem atenção em estudos futuros. O estudo do impacto destas questões socioeconómicas sobre as escolhas alimentares e nutricionais necessitam ser mais exploradas tendo em vista a identificação das relações de causalidade para a construção de medidas de intervenção cada vez mais adequadas às necessidades desta população. A combinação dos resultados das análises dos dados dos inquéritos aos orçamentos familiares com medidas diretas de ingestão de alimentos poderia esclarecer ainda mais os hábitos alimentares das pessoas mais velhas, especialmente à luz da necessidade de incorporar a concepção de ciclo vital[53].

As análises conduzidas nesta investigação inauguram a apreciação específica de dados alimentares e nutricionais dos idosos com representatividade nacional. Apesar dos resultados oferecerem informações sobre as características e dos determinantes da disponibilidade alimentar e nutricional deste grupo, muito mais ainda há por se esclarecer. A comparação dos diferentes níveis de dados dietéticos portugueses[82] especificamente para os idosos poderia servir para apreciar e ajustar o uso dos dados dietéticos derivados dos inquéritos aos orçamentos familiares. Neste sentido, o desenvolvimento combinado dos dados dietéticos dos inquéritos aos orçamentos familiares com inquéritos individuais sobre o consumo alimentar em uma sub-amostra da população poderia potencializar a identificação regular dos hábitos alimentares no país[79,173,174]. A identificação detalhada dos alimentos consumidos fora do domicílio é uma limitação que também precisa ser superada e constitui uma pergunta de investigação a ser respondida por estudos futuros[64]. Dentre as muitas outras possibilidades futuras de investigação, pode-se também citar o estudo da contribuição relativa de cada grupo alimentar segundo no total de energia e distribuição dos macronutrientes disponíveis no interior dos agregados. Os dados alimentares dos inquéritos aos orçamentos familiares também poderiam ser apreciados considerando-se a capacidade de acesso aos bens e serviços, a partir do estudo das iniquidades alimentares e nutricionais. A comparação da capacidade de acesso, mensurável pela análise dos rendimentos do agregado, também poderia compor uma futura investigação. Esta apreciação ganha maior importância especialmente para os grupos socialmente desfavorecidos, como os idosos, especialmente num cenário de crise como o da atualidade.

6 Referências Bbliográficas

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173-

Anexos

Anexo 1: Características das variáveis contidas em cada um dos ficheiros dos Inquéritos aos Orçamentos Familiares

a - Dados dos agregados familiares (AF): identificação do AF (código anonimizado), ponderador populacional, trimestre de participação, região (7 regiões nacionais de acordo com NUT II), grau de urbanização do local onde se encontra o AF (rural, semi-urbano, urbano), número de membros do AF, rendimento líquido do AF, gastos totais do AF (segundo as diferentes rubricas de gasto), gastos totais com alimentação, gastos totais com alimentação fora de casa, gastos totais com despesas médicas;

b - Dados dos membros do AF: identificação do AF (código anonimizado), ponderador populacional, sexo de cada um dos membros do AF, idade de cada um dos membros do AF (de preferência em anos e não em grupos etários), grau de parentesco ao responsável do AF de cada um dos membros do AF, grau de escolaridade de cada um dos membros do AF, ocupação de cada um dos membros do AF, situação perante o trabalho de cada um dos membros do AF, atividade económica de cada um dos membros do AF, rendimento do responsável do AF;

c - Dados alimentares dos AF: identificação do AF (código anonimizado), ponderador populacional, código alimentar (classificação COICOP ao nível desagregado: produtos alimentares e bebidas não alcoólicas, bebidas alcoólicas e hotéis, restaurantes, cafés e similares); gastos por código alimentar, quantidade comprada por código alimentar, unidade de medida de cada código alimentar, tipo de consumo (compra, oferta, auto-consumo, auto-abastecimento, etc).

Anexo 2: Harmonização dos Códigos dos alimentos segundo Classificação do Consumo Individual por Objectivo (COICOP) e grupos alimentares DAFNE-ANEMOS

PORTUGAL – FOOD AGGREGATION TABLE FOR CEREALS AND CEREAL PRODUCTS

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
BREAD						**BREAD AND ROLLS**	
1113101	Rye bread	1113101	Rye bread	01112101	Rye bread	1112101	Rye bread
1113102	Whole meal bread	1113102	Whole meal bread	01112102	Whole meal bread	1112201	Wholemeal bread - individual units
						1112202	Wholemeal bread - large units
1113104	Cornmeal bread	1113104	Cornmeal bread	01112103	Cornmeal bread	1112102	Cornmeal bread
1113106-1113108, 1113110	Wheat bread	1113106-1113108, 1113110	Wheat bread	01112104-01112107	Wheat bread	1112103	Wheat bread, 45gr weight
						1112104	Wheat bread, baguette
						1112105	Wheat bread, big
						1112106	Regional bread
1113109	Mixed cereal bread	1113109	Mixed cereal bread	01112108	Mixed cereal bread	1112107	Mixed cereal bread, big
						1112108	Mixed cereal bread, small units
1113111	Other kinds of bread not described#	1113111	Other kinds of bread not described	01112110	Sliced loaf	1112110	Sliced loaf
				01112112	Other kinds of bread not described	1112112	Hamburger and Hot-dog bread
						1112113	Other types of bread, non wholemeal, n.d.
						1112204	Other types of wholemeal bread n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR CEREALS AND CEREAL PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
OTHER BAKERY PRODUCTS						**BAKERY PRODUCTS (bread and rolls excluded)**	
1113201	Toasts	1113201	Toasts	01112111	Toasts	1112111	Toasts
						1112203	Wholemeal toasts
1113105	Breadcrumbs	1113105	Breadcrumbs	01112201	Breadcrumbs	1112401	Breadcrumbs
1114101	Biscuits	1114101	Biscuits	01112202	Other bakery products not described (gressino, etc.)	1112402	Other kinds of bread products n.d. (e.g.gressinos)
1114102	"Petit beurre" biscuits	1114102	Vanilla biscuits	01112305	Biscuits (plain, with no cream)		
						1112503	Short-cake like biscuits
				01112301	Maria like biscuits and cream cracker biscuits	1112501	Maria like biscuits
						1112502	Cream-cracker like biscuits
				01112306	Biscuits (filled with cream)	1112504	Wholemeal or cereal mixture biscuits
1114103	Short-cake like biscuits	1114103	Short-cake like biscuits	01112302	Short-cake like biscuits	1112505	Biscuits with cover or inside cream
1114104	Other biscuits not described#	1114104	Other biscuits not described	01112307	Other biscuits not described	1112506	Other type of biscuits n.d.
				01112304	Other biscuits not described	1112507	Biscuits
1113103	Milk bread	1113103	Milk bread	01112109	Milk bread	1112109	Milk bread
1114201*98	Croissant and similar[1]	1114201*98	Croissant and similar[1]				

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR CEREALS AND CEREAL PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
OTHER BAKERY PRODUCTS						**BAKERY PRODUCTS (bread and rolls excluded)**	
1114202*62	Sponge cakes, muffins[2]	1114202*62	Sponge cakes, muffins[2]	01114101*68	Croissants, sponge cakes, muffins[4]	1114101*68	Sponge cakes, croissants and the like[4]
1114203*61	Cream cakes[3]	1114203*61	Cream cakes[3]	01112303	Biscuits with cover or inside cream		
1114204	Large cakes	1114204	Large cakes				
1116201	Convenience dough/pastry–raw	1116202	Convenience dough/pastry ready to fill in	01113105	Convenience dough/pastry	1113201	Short crust and puff pastry - refrigerated and frozen
1116202	Convenience dough/pastry –ready to fill in	1116201	Convenience dough/pastry raw	01114102*78	Cream cakes[3]	1114102*78	Cream cakes3
				01114103*94	Croissant with cream and similar[1]	1114103*120	Pizza, crepe, pie[7]
				01114104*100	Sweet pies[4]	1114104	Birthday cakes[4]
				01114105*1000	Large cakes[5]	1114105	Large cakes[5]
						1114106	Other bakery products n.d.
						1112301	Filled bread
						1115101*90	Sandwich (except for consumption in restaurants, cafes and the like)[8]
						1116402	Other cereal based products n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR CEREALS AND CEREAL PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
RICE						**RICE, CEREALS AND PRODUCTS (flour and pasta excluded)**	
1111101-1111103	Rice	1111101-1111104	Rice	01111101-01111106	Rice	1111101	Extra-long rice
						1111102	Long rice
1111104	Rice#					1111103	Medium rice
						1111104	Parboiled rice
						1111105	Wholemeal rice
						1111106	Organically grown rice
						1111107	Other kinds of raw rice n.d.
BREAKFAST CEREALS						**RICE, CEREALS AND PRODUCTS (flour and pasta excluded)**	
1116101	Breakfast cereals (Nestum)	1116102	Other flakes (rice, wheat, chocolate, etc.)	01115204	Corn-flakes	1116201	Oat flakes (Nestum, Miluvit)
1116102	Other flakes (rice, wheat, chocolate, etc).	1116101	Breakfast cereals (Nestum)			1116202	Corn-flakes (Kelloggs, Quaker, National)
1116103	Corn-flakes	1116103	Corn-flakes	01115205	Other flakes (rice, wheat, chocolate, etc.)	1116203	Wholemeal cereals (All bran, Wetabix)
1116104	Oat-flakes	1116104	Oat-flakes	01115206	Wholemeal flakes (all-bran, etc.)	1116204	Chocolate/sugar cereals (Choco krispies, frosties, estrelitas)
1116301	Other cereal based products not described#	1116301	Other cereal based products not described	01115203	Breakfast cereals (Nestum)	1116205	Muesli type

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR CEREALS AND CEREAL PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
BREAKFAST CEREALS						**RICE, CEREALS AND PRODUCTS (flour and pasta excluded)**	
						1116206	Cereal based flours (to eat with added milk)
						1116207	Other breakfast cereals n.d.
FLOUR							
1112101	Corn flour	1112101	Corn flour	01115101	Corn flour		
1112102	Wheat flour	1112102	Wheat flour	01115102	Wheat flour	1116102	Wheat flour
1112103	Wheat toasted flour	1112103	Wheat toasted flour	01115103	Wheat toasted flour		
1112104	Self-raising mixed flour	1112104	Self-raising mixed flour	01115104	Self-raising mixed flour	1116103	Self-raising mixed flour
1112105	Corn flour (Maizene)	1112105	Corn flour (Maizene)	01115105	Corn flour (Maizene)	1116101	Maizene (corn flour)
1116105	Semolina	1116105	Semolina				
1112106	Other kinds of flour#	1112106	Other kinds of flour	01115106	Other kinds of flour not described	1116104	Other type of flour n.d. (rice flour)
PASTA							
1115101	Average pasta	1115101	Average pasta	01113101	Small shape pasta	1113101	Pasta - small shape
1115102	Superior quality pasta	1115102	Superior quality pasta	01113102	Big shape pasta	1113102	Pasta - large shape
1115103	Spaghetti	1115103	Spaghetti	01113103	Spaghetti	1113103	Spaghetti

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR CEREALS AND CEREAL PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
PASTA							
1115104	Other pasta not described#	1115104	Other pasta not described	01113106	Other types of pasta not described	1113104	Other types of pasta - raw, not refrigerated nor frozen n.d.
1115201	Foreign pasta	1115201	Foreign pasta			1113203	Other type of pasta/pastry refrigerated or frozen n.d.

For these codes no purchases were made by any of the participating households.

NOTES FOR CEREALS AND CEREAL PRODUCTS:
CEREALS-1 Code “1114201” (croissant and similar): Average weight per piece: 98 g. Code “01114103” (croissant with cream and similar): Average weight per piece: 94 g.
CEREALS -2 Code “1114202” (sponge cakes, muffins) and code “01114101” (croissants, sponge cakes, muffins): Average weight per piece: 68 g.
CEREALS -3 Code “1114203” (cream cakes): Average weight per piece: 61 g. Code “01114102” (cream cakes): Average weight per piece: 78 g.
CEREALS -4 Code “01114104” (sweet pies/Birthday cakes): Average weight per piece: 100 g.
CEREALS -5 Code “01114105” (large cakes): Average weight per piece: 100 g.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
RED MEAT							
PORK MEAT (fresh and frozen)							
1123102-1123109	Pork meat	1123102-1123110	Pork meat	01122101-01122109 + 01122111-01122112	Pork meat	1122101	Pork meat (boneless)
1123110	Pork meat#					1122102	Pork - loin chops
						1122103	Pork cutlets - rib chops
						1122104	Pork cutlets - sirloin chops
						1122105	Pork - leg or shoulder with bone
						1122106	Pork - spare ribs
						1122112	Other types of pork meat n.d.
1123201	Sucking pig	1123201	Sucking pig	01122201	Sucking pig	1122201	Sucking pig
						1122107	Side pork (bacon) - fresh
						1122108	Pork middle, without bones – fresh
BEEF, VEAL AND CALF MEAT (fresh and frozen)							
1121101-1121107	Beef meat	1121101-1121108	Beef meat	01121101-01121108	Beef meat	1121101	Beef fillet
						1121102	Sirloin beef steak

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
RED MEAT (continued)							
BEEF, VEAL AND CALF MEAT (fresh and frozen)							
						1121103	Beef chop
						1121104	Beef type 1 without bone
						1121105	Beef type 1 with bone
						1121106	Beef type 2 without bone
						1121107	Beef type 2 with bone
						1121108	Other qualities of beef n.d.
1121108	Beef meat#			01121201-01121208	Veal meat	1121201	Veal fillet
1122101-1122106	Veal meat	1122101-1122107	Veal meat			1121202	Sirloin veal steak
1122107	Veal meat#					1121203	Veal chops
						1121204	Veal meat type 1 without bone
						1121205	Veal meat type 1 with bone
						1121206	Veal meat type 2 without bone

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
RED MEAT (continued)							
OTHER RED MEAT (fresh and frozen- continued)						RED MEAT OTHER THAN PORK AND BEEF (fresh and frozen - continued)	
1124101-1124104	Goat meat	1124101-1124105	Goat meat	01123101-01123105	Kid meat	1123101	Kid - all animal
						1123102	Kid - longitudinal half
						1123103	Kid - front half
						1123104	Kid - hind half
						1123105	Other qualities of kid meat n.d.
1124105	Goat meat#			01123201-01123205	Goat meat	1123201	Goat - all animal
						1123202	Goat - longitudinal half
						1123203	Goat - front half
						1123204	Goat - hind half
						1123205	Other qualities of goat meat n.d.
1124201-1124204	Sheep or lamb meat	1124201-1124205	Sheep or lamb meat	01123301-01123306	Sheep meat	1123301	Lamb - loin cutlets
1124205	Sheep or lamb meat#			01123401-01123406	Mutton meat	1123302	Lamb - other cutlets
1124301	Goat or lamb-type meat#	1124301	Goat or lamb-type meat#			1123303	Lamb – leg

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
RED MEAT (continued)							
OTHER RED MEAT (fresh and frozen)						RED MEAT OTHER THAN PORK AND BEEF (fresh and frozen)	
						1123304	Lamb – shoulder
						1123305	Lamb breast
						1123306	Other types of lamb meat n.d.
						1123401	Mutton - loin cutlets
						1123402	Mutton - other cutlets
						1123403	Mutton – leg
						1123404	Mutton – shoulder
						1123405	Mutton breast
						1123406	Other types of mutton meat n.d.
						1127104	Other meats n.d. - fresh, refrigerated or frozen
				01127101	Horse meat#	1127101	Horse - fresh, refrigerated or frozen
1128101-1128102	Horse meat	1128101+1128103	Horse meat	01127102	Horse meat		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
RED MEAT (continued)							
OTHER RED MEAT (fresh and frozen)						**RED MEAT OTHER THAN PORK AND BEEF (fresh and frozen)**	
1128103	Horse meat#			01127103	Horse meat#		
1128201, 1128401	Rabbit meat	1128102	Horse loin#	01127401	Other meat (crocodile, etc.)		
		1128201+1128401	Rabbit meat	01127201-01127202	Rabbit meat		
				01127301-01127302	Hare and wild rabbit		
OFFAL (fresh and frozen)							
1123101	Head (pork)	1123101	Head (pork)	01125201	Heart	1122110	Pig's head
1128301	Cow tripe	1128301	Cow tripe	01125202	Tripe		
						1122111	Pork's feet
1128302	Beef or veal liver	1128302	Beef or veal liver	01125203	Liver		
1128303	Pork liver	1128303	Pork liver	01125204	Tongue		
1128304	Beef or veal tongue	1128304	Beef or veal tongue	01125205	Cow’s feet		
1128305	Pork tongue	1128305	Pork tongue	01125206	Brain		
1128306	Veal brain	1128306	Veal brain	01125207	Kidney		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
OFFAL (fresh and frozen-continued)							
1128307	Sheep brain	1128307	Sheep brain	01125208	Other offal, not described		
1128308	Veal kidney	1128308	Veal kidney	01122110	Head (pork)		
1128309	Pork kidney	1128309	Pork kidney				
1128310	Other offal, not described#	1128310	Other offal, not described			1125201	Offal
POULTRY (fresh and frozen)							
1125101	Chicken with giblets	1125101	Chicken with giblets	01124101-01124107	Chicken	1124101	Chicken - whole, with or without giblets
1125102	Chicken without giblets	1125102	Chicken without giblets	01124201-01124204	Hen		
						1124102	Chicken – breast
1125103	Hen with giblets	1125103	Chicken in pieces	01124301-01124307	Turkey		
						1124103	Chicken – legs
1125104	Hen without giblets	1125104	Hen with giblets	01124401-01124402	Ostrich	1124104	Chicken – wings
						1124105	Chicken – steaks
						1124106	Chicken – giblets
						1124107	Other types of chicken n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
POULTRY (fresh and frozen-continued)							
1125105	Duck with giblets	1125105	Hen without giblets	01124501	Other poultry not described	1124201	Hen - whole, with or without giblets
						1124202	Hen in pieces
						1124203	Hen – giblets
						1124204	Other types of hen n.d.
1125106	Duck without giblets	1125106	Duck with giblets			1124401	Duck- fresh, refrigerated or frozen
1125107	Turkey with giblets	1125107	Duck without giblets				
1125108	Turkey without giblets	1125108	Turkey with giblets			1124301	Turkey - whole, with or without giblets
1125109	Other poultry not described#	1125109	Turkey without giblets				
1128402	Partridge	1125110	Turkey breast			1124302	Turkey – breast
1128403	Other game meat not described (mainly partridge & other birds) #	1125111	Turkey leg			1124303	Turkey – legs
		1125112	Turkey wings			1124304	Turkey – wings
						1124305	Turkey – steaks
						1124306	Turkey – giblets
						1124307	Other types of turkey n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
POULTRY (fresh and frozen-continued)							
		1125113	Other poultry not described				
		1128402	Partridge				
		1128403	Other game meat not described (mainly partridge & other birds)	01127303	Other game meat (e.g. partridge, pheasant)		
						1124501	Other poultry n.d. - fresh, refrigerated or frozen
						1127103	Game meat - fresh, refrigerated or frozen
MEAT PRODUCTS						**CANNED MEAT AND MEAT PRODUCTS**	
1126101	Traditional sausages (bird or pork)	1126101	Traditional sausages (bird or pork)	01125101+01125106	Traditional sausages (bird or pork)	1125101	Traditional sausages (bird or pork meat with bread)
						1125104	Traditional sausages (bird or pork meat with bread)
1126102	Traditional sausages (chorizo)	1126102	Traditional sausages (chorizo)	01125102+01125105	Traditional sausages (chorizo)	1125102	Traditional sausages (chorizo)
1126103	Traditional sausages (black pudding like)	1126103	Traditional sausages (black pudding like)	01125103+01125107	Traditional sausages (black pudding like)	1125105	Black pudding
1126104	Other types of traditional sausages	1126104	Other types of traditional sausages	01125104	Other types of traditional sausages	1125103	Traditional sausages (meat)
1126105	Traditional sausages (bird or pork)	1126105	Traditional sausages (bird or pork)	01125108	Ham	1125106	Ham
1126106	Ham	1126106	Ham	01125109+ 01125115	Salami	1125107	Salami

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MEAT PRODUCTS (continued)						**CANNED MEAT AND MEAT PRODUCTS (continued)**	
1126107	Traditional sausages (meat)	1126107	Traditional sausages (meat)	01125110	Fried pork fat	1122109	Pork middle, without bones - salty
						1125108	Fried pork fat
1126108	Black pudding	1126108	Black pudding	01125111	Rolled ham	1125109	Rolled ham
1126109	Salami	1126109	Salami	01125112	Meat pâtés	1125110	Meat pâté
						1125112	Type of sausage made of pickled pork
1126110	Cured ham with bone	1126110	Cured ham with bone	01125113	Cured ham with bone	1125111	Cured ham
1126111	Cured ham without bone	1126111	Cured ham without bone	01125114	Cured ham without bone		
1126112	Canned sausages	1126112	Canned sausages	01125118	Canned sausages	1125114	Canned sausages
1126113	Fresh sausages	1126113	Fresh sausages	01125117	Fresh sausages	1125113	Fresh sausages
1126114	Smoked bacon	1126114	Smoked bacon	01125119	Smoked bacon	1125115	Smoked bacon
1126115	Other sausages and processed meat#	1126115	Other sausages and processed meat	01125120	Other sausages and processed meat	1125116	Other sausages and processed meat n.d.
1127101	Escallops and chops (breaded)	1127101	Escallops and chops (breaded)	01126101	Escallops and chops (breaded)	1126101	Escallops and chops (breaded)
1127103*50.3	Frozen meat croquette and pies[1]	1127103*50.3	Frozen meat croquette and pies[1]	01126106*50.3	Frozen meat croquette and pies[1]		
1127104	Roasted chicken	1127104	Roasted chicken	01126102	Roasted chicken	1126102	Roasted chicken

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MEAT PRODUCTS (continued)						**CANNED MEAT AND MEAT PRODUCTS (continued)**	
1127105	Roasted sucking pig	1127105	Roasted sucking pig	01126103	Roasted sucking pig	1126103	Roasted suckling pig
1127106	Roasted pork loin	1127106	Roasted pork loin	01126104	Roasted pork loin	1126104	Roasted pork loin
1127107*79	Meat pies[2]	1127107*79	Meat pies[2]	01126105*50.3	Meat croquette and pies[1]	1126105*50.3	Meat croquette and pies[1]
1127108	Other cooked meat based products#	1127108	Other cooked meat based products	01126107	Frozen hamburgers	1126106	Frozen hamburgers
MEAT DISHES							
1127201	Frozen meat based meals	1127201	Frozen meat based meals	01126109	Other meat based products not described	1126107	Other processed/ready to eat meat based products n.d.
1127202	Not frozen meat based meals	1127202	Not frozen meat based meals	01126201	Meat based meals		
				01126202	Frozen meat based meals		
				01126202	Frozen meat based meals		
1127204	Other meat based meals not described#	1127204	Other meat based meals not described	01113104*0.60	Ready made meat pasta[3]	1113202*0.59	Ready to eat pasta with meat, fish, seafood or vegetables - refrigerated and frozen3
1127203*13.5	Packed powdered meat based soups[4]	1127203*13.5	Packed powdered meat based soups[4]	01111201*0.60	Ready made meat rice[3]	1111201*0.59	Cooked rice with meat, fish, seafood or vegetables2
				01111202*0.60	Frozen ready made meat rice[3]		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MEAT, MEAT PRODUCTS AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MEAT DISHES							
				01193201*1000	Meat based soups (in packages)[5]		

For these codes no purchases were made by any of the participating households.

NOTES FOR MEAT, MEAT PRODUCTS AND DISHES:
MEAT-1 Codes "1127103", "01126106" (frozen meat croquette and pies) and code "01126105" (meat croquette and pies): Average weight per piece: 50.3 g.
MEAT-2 Code "1127107" (meat pies): Average weight per piece: 79 g.
MEAT-3 Codes "01113104" (ready made fish, seafood or meat pasta), "01111201" (ready made fish, seafood or meat rice) and "01111202" (frozen ready made fish, seafood or meat rice): 40% fish and seafood and 60% meat.
MEAT-4 Code "1127203" Multiplication by 13.5 is used for the conversion of powdered soups into liquid equivalent: 74g (average weight of 27 packed powdered soups) are used to prepare 1L of the final soup.
MEAT-5 Code "01193201" (meat based soups): 1 package of soup = 1 litre of soup. In addition, 91% powdered soups and 9% liquid ones.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH AND FROZEN FISH							
FISH (fresh, frozen and processed)							
1131101-1131123	Fresh fish–different species	1131101-1131124	Fresh fish–different species	01131101-01131125+ 01131127	Fresh fish – different species	1131101	Fork-beard (Phycis phycis)
1131124	Fresh fish–different species#					1131102	Tuna fish
1131201-1131208	Frozen fish–different species			01131201-01131211+ 01131213	Frozen fish – different species	1131103	Blackspot sea bream
1131209	Frozen fish–different species#	1131201-1131209	Frozen fish–different species			1131104	Bogue
SALTY AND DRIED FISH						1131105	Snaper
1132101-1132105 1131106	Salty and dried cod fish	1132101-1132106	Salty and dried cod fish	01133101-01133107	Salty and dried cod fish	1131107	Jack-fish/horse mackerel
1132106	Salty and dried cod fish#	1132107, 1132108	Other salty and dried fish	01133108	Other salty and dried fish	1131108	Spanish mackerel
1132107,1132108	Other salty and dried fish#					1131109	Pomfret
						1131110	Wreckfish/grouper
						1131111	Big jack-fish
						1131112	Meagre/sea bass
						1131113	Whiting/bib/pout

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH AND FROZEN FISH (continued)							
SMOKED AND CANNED FISH						1131114	Sea bream
1132201- 1132203	Pickle/brine fish	1132202	Pickle/brine fish#	01133109+01133110	Smoked fish	1131115	Alfonsino, Imperador, Red Bream (Beryx decadactylus)
1132204	Pickle/brine fish#	1132201, 1132203+1132204	Pickle/brine fish	01134101-01134105	Canned fish	1131116	Sole like fishes
		1132301	Smoked fish			1131117	Hake (small)
1132301	Smoked fish#	1133101-1133102, 1133104-1133106, 1133201	Canned fish			1131118	Red snapper
1133101-1133105	Canned fish	1133103	Canned fish#			1131119	Sword fish
1133106 + 1133201	Canned fish#					1131120	John Dory/moonfish
						1131114	Sea bream
						1131121	Red fish
						1131122	Hake
						1131123	Conger eel
						1131124	Mackerel (Scomber scombrus Linnaeus)
						1131125	Sardines

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH AND FROZEN FISH (continued)							
						1131127	Other fish - fresh or refrigerated n.d.
						1131201	Fork-beard (Phycis phycis) – frozen
						1131202	Snaper – frozen
						1131203	Jack-fish/horse mackerel – frozen
						1131204	Hake fillets – frozen
						1131205	Other fish fillets - frozen n.d.
						1131206	Sea bream – frozen
						1131207	Maruca (Genypterus Blacodes)
						1131208	Red snapper – frozen
						1131209	Red fish – frozen
						1131210	Hake – frozen
						1131211	Sardines - frozen
						1131213	Other frozen fishes n.d.
						1133101	Salty and dried cod fish - special

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH AND FROZEN FISH (continued)							
						1133102	Salty and dried cod fish - big
						1133103	Salty and dried cod fish - grown up
						1133104	Salty and dried cod fish - average
						1133104	Salty and dried cod fish - average
						1133105	Salty and dried cod fish in pieces
						1133106	Other parts of salty and dried cod fish (heads/tongues/small pieces)
						1133107	Smoked salmon
						1133108	Other salty, dried or smoked fishes n.d.
						1134101	Canned tuna fish
						1134102	Canned sardines
						1134103	Other canned fishes n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SEAFOOD							
1134101	Mussels	1134101	Mussels	01132101	Fresh Mussels	1132101	Mussels (fresh/refrigerated)
1134102	Cockles	1134102	Cockles	01132102	Fresh Cockles	1132102	Cockles (fresh/refrigerated)
1134103	"Cavaco" (Scyllarides latus) #	1134103	"Cavaco" (Scyllarides latus) #	01132103	Fresh Shrimps and prawns	1132103	Shrimps and prawns (fresh/refrigerated)
1134104	Shrimps and prawns	1134104	Shrimps and prawns	01132104	Fresh Snails	1132104	Snails (fresh/refrigerated)
1134105	Snails	1134105	Snails	01132105	Cuttlefish	1132105	Cuttlefish (fresh/refrigerated)
1134106	Cuttlefish	1134106	Cuttlefish	01132106	Fresh Lobster	1132108	Lavagante (Homarus gammarus) (fresh/refrigerated)
1134107	Lobster	1134107	Lobster	01132107	Fresh Crayfish#		
1134108	Crayfish	1134108	Crayfish	01132108	Fresh "Lavagante" (Homarus gammarus) #		
1134109	"Lavagante" (Homarus gammarus) #	1134109	"Lavagante" (Homarus gammarus) #	01132109	Squids	1132109	Squids (fresh/refrigerated)
1134110	Squids	1134110	Squids	01132110	Crabs	1132110	Crabs (fresh/refrigerated)
1134111	Crabs	1134111	Crabs	01132111	Fresh octopus	1132111	Octopus (fresh/refrigerated)
1134112	Octopus	1134112	Octopus	01132112	Spider crabs and edible crabs	1132112	Spider crabs and edible crabs
1134113	Spider crabs	1134113	Spider crabs	01132113	Other fresh crustaceans and molluscs not described		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SEAFOOD (continued)							
1134114	Other crustaceans and molluscs not described#	1134114	Other crustaceans and molluscs not described	01132201	Frozen Cockles	1132201	Cockles (frozen)
				01132202	Frozen Shrimps and prawns	1132202	Shrimps and prawns(frozen)
				01132203	Frozen Cuttlefish	1132203	Cuttlefish (frozen)
				01132204	Frozen Squids	1132204	Squids (frozen)
				01132205	Frozen octopus	1132205	Octopus (frozen)
1134201-1134205	Frozen crustaceans and molluscs						
1134206	Frozen crustaceans and molluscs#	1134201-1134206	Frozen crustaceans and molluscs	01132206	Other frozen crustaceans and molluscs	1132206	Other frozen crustaceans/molluscs species n. d.
1134301	Crustaceans and molluscs salted and dried#	1134301	Crustaceans and molluscs salted and dried#	01133201	Crustaceans and molluscs salted and dried or smoked		
1134401	Canned/tinned crustaceans and molluscs#	1134401	Canned/tinned crustaceans and molluscs	01134201	Canned/tinned crustaceans and molluscs#	1134201	Canned/crustaceans and molluscs
1131125	Fish liver, roe etc. #	1131125	Fish liver, roe etc.	01134202-01134204	Canned/tinned crustaceans and molluscs		
				01131212, 01131126	Fresh fish liver, roe etc.	1131212	Fish liver, roes- frozen
						1131126	Fish liver, roes- fresh

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FISH AND SEAFOOD DISHES						FISH DISHES	
1135101	Boiled shrimps and prawns#	1135101	Boiled shrimps and prawns	01134301	Boiled shrimps and prawns	1134301	Boiled shrimps and prawns
1135102	Other boiled crustaceans and molluscs#	1135102	Other boiled crustaceans and molluscs	01134302	Other boiled crustaceans and molluscs	1134302	Other boiled crustaceans and molluscs n.d.
1135103*33	Frozen fish and seafood croquettes and pies[3]	1135103*33	Frozen fish and seafood croquettes and pies[3]	01134304*31	Fresh cod croquettes3	1134303	Imitation seafood sticks
1135106*50.5	Frozen seafood pastries[4]	1135106*50.5	Frozen fish and seafood croquettes and pies[4]	01134305*31	Frozen cod croquettes	1134304	Fish or seafood cakes and croquettes
1135104*31	Cod croquettes[5]	1135104*31	Cod croquettes[5]	01134306*50.5	Fresh fish and seafood pastries	1134305	Fish or seafood pâté
1135105*50.5	Fish and seafood Croquettes[6]	1135105*50.5	Fish and seafood croquettes[6]	01134307*50.5	Frozen fish and seafood pastries[2]	1134306	Other convenience products based on fish, crustaceans or molluscs n.d.
1135201	Frozen fish and seafood based meals	1135201	Frozen fish and seafood based meals	01134309+01134303	Other fish and seafood based products not described	1111201*0.39	Cooked rice with meat, fish, seafood or vegetables[1]
1135202	Fish and seafood based meals	1135202	Fish and seafood based meals	01134401	Fresh fish based meals	1113202*0.39	Ready to eat pasta with meat, fish, seafood or vegetables-refrigerated and frozen[2]
				01134402	Frozen fish based meals		
		1135204	Other fish/seafood based meals	01111201*0.4	Ready made fish, seafood rice[1]		
1135203*13.5	Packed powdered fish based soups[6]	1135203*13.5	Packed powdered fish based soups[8]	01193202*1000	Fish based soups (in packages)[9]		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FISH, SEAFOOD AND DISHES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FISH AND SEAFOOD DISHES (continued)						FISH DISHES (continued)	
		1135108	Other convenience fish/seafood based products				
				01113104*0.40	Ready made fish, seafood pasta[7]		
				01111202*0.40	Frozen ready made fish, seafood rice[7]		

For these codes no purchases were made by any of the participating households.

NOTES FOR FISH, SEAFOOD AND DISHES:
FISH-1 Code "01111201" (Cooked rice with meat, fish, seafood or vegetables): 59% meat, 39% fish and seafood and 2% vegetables.

FISH-2 Code "11113202" ((Ready to eat pasta with meat, fish, seafood or vegetables- refrigerated and frozen): 59% meat, 39% fish and seafood and 2% vegetables.

FISH-3 Code "1135103" (frozen fish and seafood croquette and pies): Average weight per piece: 33g.

FISH-4 Code "1135106" (frozen seafood pastries/ frozen fish and seafood croquettes and pies[4]): Average weight per piece: 50.5g.
FISH-5 Code "1135104" (cod croquette): Average weight per piece: 31g.

FISH-6 Code "1135105" (fish and seafood croquette): Average weight per piece: 50.5g

FISH-7 Codes "1113104" (ready made fish, seafood or meat pasta) and "01111202" (frozen ready made fish, seafood or meat rice): 40% fish and seafood and 60% meat.

FISH-8 Multiplication by 13.5 is used for the conversion of powdered soups into liquid equivalent: 74g (average weight of 27 packed powdered soups) are used to prepare 1L of the final soup.

FISH-9 Code "01193202" (fish based soups): 1 package of soup = 1 litre of soup. In addition, 91% powdered soups and 9% liquid ones.

PORTUGAL – FOOD AGGREGATION TABLE FOR EGGS, MILK AND MILK PRODUCTS

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
EGGS							
1145101	Chicken eggs	1145101	Chicken eggs	01147101	Chicken eggs	1147101	Chicken eggs
1145102	Other fresh eggs not described#	1145102	Other fresh eggs not described	01147102	Fresh eggs other than chicken eggs	1147102	Organically grown chicken eggs
1145201/60	Processed eggs[1]	1145201/60	Processed eggs#	01147201/60	Processed eggs[1]	1147103	Other eggs - non chicken (duck)
						1147201/60	Other type of eggs (improved with additives) [1]
MILK							
1141101	Milk in bulk	1141101	Milk in bulk	01141101	Milk in bulk	1141101	Pasteurized milk (day milk) (cow)
1141102	Homogenized milk	1141102	Homogenized milk	01141102	Pasteurised milk	1141201	UHT milk (cow)
1141103	Pasteurised milk	1141103	Pasteurized milk	01141103	UHT milk - whole	1141301	Special milks (extra calcium, omega3, lactose free)
1141104	UHT milk	1141104	UHT milk	01141104	UHT milk - semi-skimmed	1141401	Organically growth milk
1141105	Special milks	1141105	Special milks	01141105+ 01142101	UHT milk - skimmed	1141402	Other cow milks n.d.
1141201	Other liquid milks not described#	1141201	Other liquid milks not described	01141106	Special milks	1141501	Other milks (goat, sheep)

For these codes no purchases were made by any of the participating households.

NOTES FOR EGGS: The average weight for an egg is 60 g. Division by 60 gives the number of pieces of eggs.

PORTUGAL – FOOD AGGREGATION TABLE FOR EGGS, MILK AND MILK PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MILK (continued)							
1142201*8	Powdered semi-skimmed milk1	1142201*8	Powdered semi-skimmed milk1	01141201	Liquid milks other than cow milk	1142101	UHT milk - skimmed 1L
1142202*8	Powdered whole milk[1]	1142202*8	Powdered whole milk[1]	01143202*8	Instant powdered milk1	1142102	Other skimmed milk (not aromatized)
1142203*8	Instant powdered skimmed milk[1]	1142203*8	Instant powdered skimmed milk[1]	01143204*8	Other powdered milks not described[1]	1143201*8	Powdered milk - current[1]
1142205	Other powdered milks not described#	1142205*8	Other powdered milks not described[1]			1143203*8	Other powdered milks n.d.[1]
						1146101	Milk - aromatized
						1146102	Soya milk
						1146103	Other kind of milk with other ingredients n.d.
CHEESE							
1143104	Curd cheese	1143105	Curd cheese	01145101	Goat's cheese	1145101	Serra cheese 25,5%fat
1144101	Goat's cheese	1144101	Goat's cheese	01145102	Cream cheese	1145102	Serra like cheese 25,5%fat
1144102	Cream cheese	1144102	Cream cheese	01145103*1.5	"Flamengo" like cheese[2]	1145103	Serpa cheese
1144103*1.5	Foreign "flamengo" cheese[2]	1144103*1.5	Foreign "flamengo" cheese[2]	01145104	Fresh cheese	1145104	Castelo Branco cheese
1144104	National "flamengo" cheese	1144104	National "flamengo" cheese	01145105*1.5	"Ilha" cheese[2]	1145105	Beira baixa cheese
1144105	Cottage cheese	1144105	Cottage cheese	01145106	Mixture cheese	1145106	Nisa cheese

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR EGGS, MILK AND MILK PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
CHEESE (contimued)							
1144106*1.5	"Ilha" cheese[2]	1144106*1.5	"Ilha" cheese[2]	01145107	"Niza" cheese	1145107*1.5	Ilha S. Jorge cheese[2]
1144107	"Serra" cheese	1144107	"Serra" cheese	01145108	Sheep cheese	1145108*1.5	Ilha Pico cheese[2]
1144108	"Serra" like cheese	1144108	"Serra" like cheese	01145109	Piquant/spicy cheese	1145109	Sheep cheese
1144109	Other cheese not described#	1144109	Other cheese not described	01145110	"Serra" cheese	1145110	Goat's cheese
				01145112	Curd cheese	1145111	Other regional cheese (cured/semi-cured) n.d.
				01145111	"Serra" like cheese	1145201	Cottage cheese
				01145113	Other cheese not described	1145202	Curd cheese
						1145203	Goat's fresh cheese
						1145204	Other cottage or curd cheeses n.d.
						1145301*1.5	"Flamengo" like cheese (whole or in pieces)[2]
						1145302*1.5	"Flamengo" like cheese (sliced)[2]
						1145303*1.5	Other "Flamengo" like cheese
						1145401	Brie
						1145402	Camembert

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR EGGS, MILK AND MILK PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
CHEESE (continued)							
						1145403	Roquefort
						1145404	Emmental
						1145405	Gouda
						1145406	Mozzarella
						1145407	Other kind of foreign cheese n.d.
						1145501	Grated cheese (mozzarella)
						1145502	Cream cheese 25,7%fat
						1145503	Cheese based desserts (suissinhos)
						1145504	Other kind of cheese n.d.
MILK PRODUCTS (butter excluded)						**MILK PRODUCTS**	
YOGHURT						**(milk and cheese excluded)**	
1143101	Yoghurt	1143101	Yoghurt	01144101	Yoghurts, natural or aromatised	1144101	Yogurt, natural or aromatised
				01144102	Yoghurts, with small pieces of fruit	1144102	Yogurt, with small pieces of fruit
				01144103	Liquid yoghurts	1144103	Liquid yoghurts
				01144104	Mixed yoghurts with cereals, fruits etc.	1144104	Combi yoghurts (with cereals, fruits)

PORTUGAL – FOOD AGGREGATION TABLE FOR EGGS, MILK AND MILK PRODUCTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MILK PRODUCTS (butter excluded-continued)						**MILK PRODUCTS (milk and cheese excluded-continued)**	
YOGHURT							
				01144105	Other yoghurts	1144105	Soya yoghurts
OTHER MILK PRODUCTS						1144106	Other yoghurts n.d.
1143102	Fresh cream	1143103	Fresh cream	01146101	Milk based beverages	1144107	Fermented milks
1142101*2.2	Condensed milk (with sugar)[1]	1142101*2.2	Condensed milk (with sugar)[1]	01146102	Fresh cream	1185101	Ice-creams - family packaging
1143103	Milk based beverages	1143102	Milk based desserts	01146103	Milk based deserts	1185102*82.6	Ice-creams – individual packaging[3]
1143105	Other milk based products, not described#	1143104	Milk based beverages	01146104	Other milk based products	1143101*2.2	Condensed milk (with sugar)[1]
1104101	Ice creams#	1143106	Other milk based products not described	01143101*2.2	Condensed milk (with sugar)[1]	1146301	Fresh cream
		1104101	Ice creams	01185101	Big ice creams	1146302	Chantilly (type of sweet whipped cream)
				01185102*82.6	Small individual ice creams[3]	1146303	Other milk based products for cooking n.d.
						1146201	Milk based desserts (chocolate mousse, creme bruleé)

For these codes no purchases were made by any of the participating households.

NOTES FOR MILK AND MILK PRODUCTS:
MILK-1 All milk items (e.g. condensed milk, dried milk) are converted to fresh milk equivalents: 1 unit of condensed milk * 2.2 = 1 unit of fresh milk; 1 unit of dried milk * 8 = 1 unit of fresh milk.

MILK-2 Multiplication by 1.5 is used for the conversion of hard cheese to fresh cheese equivalents.

MILK-3 Code"01185102" (small individual ice creams): Average weight per piece: 82.6 g.

PORTUGAL – FOOD AGGREGATION TABLE FOR ADDED LIPIDS

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
LIPIDS FROM ANIMAL ORIGIN							
BUTTER							
1151101	Slightly salted butter	1151101	Slightly salted butter	01151101	Salted butter	1151101	Butter - whole
1151102	Unsalted butter	1151102	Unsalted butter	01151102 01151103	Unsalted butter Other butter	1151102	Butter - low fat
						1151104	Butter - with other ingredients
						1151105	Other butter n.d.
ANIMAL FAT (butter excluded)							
1154101	Packed lard	1154101	Packed lard	01155101	Packed lard	1155101	Lard
1154102	Lard in bulk	1154102	Lard in bulk	01155102	Lard in bulk	1155102	Other animal fat n.d.
1154103	Other animal fats not described#	1154103	Other animal fats not described	01155103	Other animal fats not described		
LIPIDS OF VEGETABLE ORIGIN							
VEGETABLE FAT							
MARGARINEAND OTHER VEGETABLE FAT							
1152101	Spread/table margarines	1152101	Spread/table margarines	01152101	Spread/table margarines	1152201	Cooking margarines
				01152104	Other margarines not described	1152202	Other cooking margarines n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR ADDED LIPIDS

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
LIPIDS OF VEGETABLE ORIGIN (continued)							
VEGETABLE FAT							
MARGARINEAND OTHER VEGETABLE FAT							
1152102	Cooking vegetable fat	1152102	Cooking vegetable fat	01152102	Cooking vegetable fat	**VEGETABLE FAT (margarine excluded)**	
				01152103	Vegetable fat with garlic or onion used for cooking	1152101	Spread/Table fats
VEGETABLE OILS							
OLIVE OIL							
1153101	Packed extra virgin olive oil	1153101	Packed extra virgin olive oil	01153101	Packed olive oil (acidity≤ 0.7°)	1153101	Packed olive oil - acidity up to 0.7
1153102	Packed olive oil	1153102	Packed olive oil	01153102 01153103	Packed olive oil (acidity≤ 1°) Packed olive oil (acidity≤ 1.5°)	1153102	Packed olive oil - acidity up to 1
1153103	Olive oil in bulk	1153103	Olive oil in bulk	01153104	Olive oil in bulk	1153103	Packed olive oil - acidity up to 1.5
						1153104	Olive oil in bulk
						1153105	Organically grown olive oil
SEED OILS (olive oil excluded)							
1153201	Peanut oil	1153201	Peanut oil	01154101	Peanut oil	1154101	Peanut oil
1153202	Sunflower oil	1153202	Sunflower oil	01154102	Sunflower oil	1154102	Sunflower oil

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR ADDED LIPIDS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SEED OILS (olive oil excluded- continued)							
1153203	Corn oil	1153203	Corn oil	01154103	Corn oil	1154103	Corn oil
1153204	Soya oil	1153204	Soya oil	01154104	Soya oil	1154104	Soya oil
1153205	Blended vegetable oils	1153205	Blended vegetable oils	01154105	Blended vegetable oils	1154105	Blended vegetable oils
1153206	Other seed oils not described#	1153206	Other seed oils not described	01154106	Other seed oils not described	1154106	Other vegetable oils n.d.

For these codes no purchases were made by any of the participating households.
NOTES FOR FATS AND OILS: For conversion into grams, vegetable oils were multiplied by 0.9.

PORTUGAL – FOOD AGGREGATION TABLE POTATOES AND OTHER STARCHY ROOTS

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
POTATOES AND OTHER STARCHY ROOTS							
FRESH POTATOES						1177101	Potatoes - whole to cook
1171101	Potatoes	1171101	Potatoes	01178101	Potatoes	1177102	Frozen potatoes (to fry, to roast)
1172101	Sweet potatoes	1172101	Sweet potatoes	01179101	Sweet potatoes	1177103	Organically grown potatoes
1172102	Other tubers not described#	1172102	Other tubers not described	01179105	Other tubers not described	1178101	Sweet potatoes
						1178102	Yam

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE POTATOES AND OTHER STARCHY ROOTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
POTATOES AND OTHER STARCHY ROOTS							
						1178103	Fried potatoes
						1178104*5	Potato flakes1
						1178105	Others tubers n.d.
						1178106	Other tuber based processed products n.d.
PROCESSED POTATOES							
1172201*5	Potato flakes1	1172201*5	Potato flakes1	01179104*5	Potato flakes1		
1172203	Frozen potatoes to fry	1172203	Frozen potatoes to fry	01179102	Frozen potatoes to fry		
1172204	Other processed potato based products not described#	1172204	Other processed potato based products not described	01179106	Other processed potato based products not described		
1172202	Fried potatoes	1172202	Fried potatoes	01179103	Fried potatoes		

For these codes no purchases were made by any of the participating households.

NOTES FOR POTATOES: Multiplication by 5 is used for the conversion of dried potatoes into fresh equivalent.

PORTUGAL – FOOD AGGREGATION TABLE FOR PULSES AND NUTS

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
PULSES							
1165101	White beans	1165101	White beans	01175101	White beans	1175101	White beans
1165102	Lima/rose coco beans	1165102	Lima/rose coco beans	01175102	Lima/rose coco beans	1175102	Lima beans/rose coco beans
1165103	Kidney beans	1165103	Kidney beans	01175103	Kidney beans	1175103	Red kidney beans
1165104	Black-eyed beans	1165104	Black-eyed beans	01175104	Black-eyed beans	1175104	Black-eyed beans
1165105	Butter beans	1165105	Butter beans	01175105	Butter beans	1175105	Butter beans
1165106	Other kinds of beans#	1165106	Other kinds of beans	01175106	Other kinds of dried beans	1175106	Other kinds of beans
PORTUGAL – FOOD 1165201	Chickpeas	1165201	Chickpeas	01175107	Chickpeas	1175107	Chickpea
1165301	Other pulses not described#	1165301	Other pulses not described	01175108	Other pulses not described	1175109	Other dried pulses n.d.
NUTS							
1162201*0.4	Almonds with shells1	1162201*0.4	Almonds with shells1	01168101*0.4	Almonds with shells1	1168107	Chestnuts
1162202	Almonds	1162202	Almonds	01168102	Almonds	1168108*0.39	Walnuts with shell1
1162203*0.73	Peanuts with shells1	1162203*0.73	Peanuts with shells1	01168103*0.73	Peanuts with shells1	1168109	Walnuts (plain, salty)
1162204	Peanuts	1162204	Peanuts	01168104	Peanuts	1168110	Pine nut
1162205*0.53	Hazelnuts with shells1	1162205*0.53	Hazelnuts with shells1	01168105*0.53	Hazelnuts with shells1	1168111	Other nuts n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR PULSES AND NUTS (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
NUTS (continued)							
1162206	Hazelnuts	1162206	Hazelnuts	01168106	Hazelnuts		
1162207	Chestnuts	1162207	Chestnuts	01168107	Chestnuts		
1162208*0.39	Walnuts with shells[1]	1162208*0.39	Walnuts with shells[1]	01168108*0.39	Walnuts with shells[1]		
1162209	Walnuts	1162209	Walnuts	01168109	Walnuts		
1162210*0.4	Pine nuts with shells[1]	1162210*0.4	Pine nuts with shells#	01168110*0.4	Pine nuts with shells[1]		
1162211	Pine nuts	1162211	Pine nuts	01168111	Pine nuts		
1162212	Other nuts not described#	1162212	Other nuts not described	01168112	Other nuts not described		

For these codes no purchases were made by any of the participating households.

NOTES FOR NUTS: Multiplication by specific fators is used for the conversion of nuts with shells to nuts without shells.

PORTUGAL – FOOD AGGREGATION TABLE FOR VEGETABLES

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH VEGETABLES (continued)							
GREEN LEAFY VEGETABLES							
1164102	Watercress (Cardamo)	1164102	Watercress (Cardamo)	01171102	Watercress (Cardamo)	1171102	Watercress
1164103	Lettuce	1164103	Lettuce	01171103	Lettuce	1171103	Lettuce
1164114	Spinach	1164114	Spinach	01171104	Spinach	1171104	Spinach
1164118	Sprouting greens	1164118	Sprouting greens	01171105	Sprouting greens	1171105	Sprouting greens
1164119	Turnip tops	1164119	Turnip tops	01171106	Turnip tops	1171106	Turnip tops
				01171107	Other leafy vegetables	1171108	Organically grown leafy vegetables
						1171109	Other leafy vegetables n.d.
						1171107	Parsley
CABBAGE							
1164108	Cauliflower	1164108	Cauliflower	01172101	Broccoli	1172101	Broccoli - fresh/refrigerated
1164109	Savoy cabbage	1164109	Savoy cabbage	01172102	Cauliflower	1172102	Cauliflower - fresh/refrigerated
1164110	Spring cabbage	1164110	Spring cabbage	01172103	Savoy cabbage	1172103	Savoy cabbage - fresh/refrigerated
1164111	Green cabbage	1164111	Green cabbage	01172104	Spring cabbage	1172104	Spring cabbage - fresh/refrigerated

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR VEGETABLES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH VEGETABLES (continued)							
CABBAGE							
1164112	Other cabbages not described#	1164112	Other cabbages not described	01172105	Green cabbage	1172105	Green cabbage - fresh/refrigerated
				01172106	Brussels sprouts	1172106	Brussels sprouts - fresh/refrigerated
				01172107	Other cabbages	1172107	Organically grown cabbages - fresh/refrigerated
						1172108	Other fresh/refrigerated cabbages n.d.
TOMATO							
1164123	Tomatoes	1164123	Tomatoes	01173108	Tomatoes	1173108	Tomato - fresh/refrigerated
CARROTS							
1164107	Carrots	1164107	Carrots	01174104	Carrots	1174104	Carrots - fresh/refrigerated
ONIONS, GARLIC AND LEEKS							
1164106	Onions	1164106	Onions	01174103	Onions	1171101	Leeks
1164106	Onions	1164106	Onions	01174103	Onions	1171101	Leeks
1164104	Garlic	1164104	Garlic	01174101	Garlic	1174101	Garlic - fresh/refrigerated
				01171101	Leeks	1174103	Onions - fresh/refrigerated

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR VEGETABLES (continued)

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
OTHER FRESH VEGETABLES							
1164113	Fresh peas	1164113	Fresh peas	01173102	Fresh peas	1173101	Pumpkin - fresh/refrigerated
1164115	Fresh broad beans	1164115	Fresh broad beans	01173103	Fresh broad beans	1173102	Peas - fresh/refrigerated
1164116	Haricots beans	1164116	Haricots beans	01173104	Fresh beans	1173103	Fava beans - fresh/refrigerated
1164117	French beans	1164117	French beans	01173105	French beans	1173104	Fresh beans - fresh/refrigerated
1164121	Cucumber	1164121	Cucumber	01173106	Cucumber	1173105	French beans - fresh/refrigerated
1164101	Pumpkin	1164101	Pumpkin	01173101	Pumpkin	1173106	Cucumber - fresh/refrigerated
1164105	Beetroot	1164105	Beetroot	01174102	Beetroot	1173107	Peppers - fresh/refrigerated
1164120	Turnips	1164120	Turnips	01174106	Turnips	1173109	Organically grown vegetables grown for the fruit
1164122	Pepper	1164122	Pepper	01174105	Mushrooms	1173110	Other vegetables grown for the fruit (eggplant, okra)
1164124	Other vegetables not described#	1164124	Other vegetables not described	01173107	Pepper	1174102	Beetroot - fresh/refrigerated
				01173109+01174107	Other vegetables not described	1174105	Turnips - fresh/refrigerated
						1174106	Organically grown roots and bulbs
						1174107	Other roots and bulbs n.d. (asparagus, radish)

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR VEGETABLES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
PROCESSED VEGETABLES							
1161124	Black olives	1161124	Black olives	01165103	Black olives	1176101	Leafy vegetables - frozen
1161125	Green olives	1161125	Green olives	01165104	Green olives	1176102	Cabbages - frozen
1163101	Stuffed olives	1163101	Stuffed olives	01169101	Processed stuffed olives	1174204	Carrots - frozen
1163102	Packed olives	1163102	Packed olives	01169102	Processed olives	1174201	Garlic - frozen
1165401	Boiled beans	1165401	Boiled beans	01177102	Boiled beans	1174203	Onions - frozen
1165402	Boiled chickpeas	1165402	Boiled chickpeas	01177103	Boiled chickpeas	1174202	Beetroot - frozen
1165404	Other processed vegetable products (based on pulses) not described#	1165404	Other processed vegetable products (based on pulses) not described	01176103	Frozen peas	1176103	Vegetables grown for the fruit (pumpking, peas, fava beans, French beans) - frozen
1166101	Frozen peas	1166101	Frozen peas	01176104	Frozen spinach	1176104	Vegetable mixture - frozen
						1174205	Mushrooms - frozen
						1174206	Turnips - frozen
						1174207	Other frozen roots, bulbs and mushrooms n.d.
						1173201	Peas canned
1166102	Frozen broad beans	1166103	Frozen French beans	01176105	Frozen broad beans	1173202	Fava beans canned

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR VEGETABLES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
PROCESSED VEGETABLES (continued)							
1166103	Frozen French beans	1166104	Other frozen vegetables	01176106	Frozen French beans	1173203	French beans canned
1166104	Other frozen vegetables#	1167101	Processed tomato in pieces	01176101	Frozen carrots	1173204	Cucumber canned
1167101	Processed tomato in pieces	1167102	Other processed vegetables not described	01176102	Frozen mushrooms	1173205	Other canned vegetables grown for the fruit (pumpkin, peas, fava beans, French beans) n.d.
1167102	Other processed vegetables not described#	1167201	Tomato purée	01176107	Frozen mixed vegetables	1176201	Tomato purée
1167201	Tomato purée	1167202	Other vegetable purée	01176108	Other frozen vegetables	1176202	Boiled beans
1167202	Other vegetable purée#			01177105	Processed tomato in pieces	1176203	Boiled chickpea
1167204	Other processed vegetable products not described#	1167204	Other processed vegetable products not described	01177104	Canned sweet corn		
1165403*13.5	Vegetable powdered soups (pulses)[1]	1165403*13.5	Vegetable powdered soups (pulses)[1]	01177108	Pickled vegetables		
1167203*13.5	Vegetable powdered soups[1]	1167203*13.5	Vegetable powdered soups[1]	01193203*1000	Vegetable based soups (in packages)[2]		
				01177101	Tomato purée		
				01177107	Other processed vegetable products not described		

For these codes no purchases were made by any of the participating households.

NOTES FOR VEGETABLES:

VEGE-1 Multiplication by 13.5 is used for the conversion of powdered soups into liquid equivalent: 74g (average weight of 27 packed powdered soups) are used to prepare 1L of the final soup.

VEGE-2 Code "01193203" (vegetable based soups): 1 package of soup = 1 litre of soup. In addition, 91% powdered soups and 9% liquid ones.

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS.

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH FRUITS							
APPLES							
1161112	Apples	1161112	Apples	01163101	Apples	1163101	Apples - "Reineta"
						1163102	Apples - "Bravo de esmolfe"
						1163103	Apples - "Golden", "Gala Royal", "Granny Smith"
						1163104	Organically grown apples
						1163105	Other apples n.d.
CITRUS FRUITS							
1161110	Oranges	1161110	Oranges	01161101	Oranges	1161101	Oranges
1161122	Tangerines and similar	1161122	Tangerines and similar	01161102	Lemons	1161102	Lemons
1161111	Lemons	1161111	Lemons	01161103	Tangerines and similar	1161103	Tangerines and similar
				01161104	Other citrus not described	1161104	Lime
						1161105	Organically grown citrus fruit
						1161106	Other citrus fruit n.d.
BANANAS							
1161106	Bananas	1161106	Bananas	01162101	Bananas	1162101	Bananas - national

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH FRUITS							
BANANAS							
						1162102	Bananas - imported
						1162103	Organically grown bananas
GRAPES							
1161123	Grapes	1161123	Grapes	01166103	Grapes	1166103	Grapes
APRICOTS AND PEACHES							
1161121	Peach	1161121	Peach	01165107	Peach	1165101	Apricot
1161102	Apricot	1161102	Apricot	01165101	Apricot	1165106	Peach
PEARS							
1161120	Pears	1161120	Pears	01164101	Pears	1164101	Pears - "Rocha"
						1164102	Organically grown pears
						1164103	Other pears n.d. (Williams)
						PLUMS	
						1165102	Plums

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH FRUITS							
						PLUMS	
						1165102	Plums
						BERRIES	
						1166101	Strawberry
						1166104	Raspberry
						1166105	Blackberry
						1166107	Other berries
						CHERRIES AND SOUR CHERRIES	
						1165104	Cherry and morello cherry
OTHER FRESH FRUITS							
1161103	Plums	1161103	Plums	01165102	Plums	1165105	Medlar
1161117	Strawberry	1161117	Strawberry	01166101	Strawberry	1165108	Other stone fruits n.d.
1161107	Cherry/morello cherry (sour cherry)	1161107	Cherry/morello cherry (sour cherry)	01166104	Other fresh berries not described	1166102	Pomegranate
				01165105	Cherry/morello cherry (sour cherry)	1167101	Avocado
1161101	Avocado	1161101	Avocado	01167101	Avocado		

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH FRUITS							
OTHER FRESH FRUITS							
1161104	Pineapple	1161104	Pineapple	01167102	Pineapple	1167102	Pineapple
				01167203	Kiwi		
1161105	Cherimoya (Custard apple)	1161105	Cherimoya (Custard apple)	01167201	Cherimoya (Custard apple)		
1161108	Figs	1161108	Figs	01167104	Figs	1167103	Persimmon/kaki/sharon fruit
1161109	Guava	1161109	Guava	01167202	Guava	1167104	Figs
1161113	Passion fruit	1161113	Passion fruit	01167204	Mango	1167105	Quince
1161114	Quince	1161114	Quince	01166102	Pomegranate	1167107	Other woody plants fruit n.d.
1161115	Watermelons	1161115	Watermelons	01167103	Persimmon/Kaki (Diospyros virginiana)	1167201	Cherimoya or custard apple
1161116	Melons	1161116	Melons	01167205	Passion fruit	1167202	Guava
1161118	Medlar	1161118	Medlar	01167105	Quince	1167203	Kiwi
1161119	Papaya	1161119	Papaya	01167301	Watermelons	1167204	Mango
1161126	Other fresh fruits not described#	1161126	Other fresh fruits not described	01167302+01167303	Melons	1167205	Passion fruit
				01165106	Medlar	1167206	Papaya

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FRESH FRUITS							
OTHER FRESH FRUITS							
				01167206	Papaya	1167207	Coconut
				01165108	Other fresh fruits with stones not described	1167209	Other tropical fruits n.d.
				01167207	Other fresh tropical fruits not described	1167301	Watermelons
				01167304	Other fresh fruits not described	1167302	Melons
						1167303	Melons
						1167304	Other organically grown fruits n.d.
						1167305	Other fresh fruit n.d.
PROCESSED FRUITS							
DRIED FRUITS							
1162101	Prunes	1162101	Prunes	01168201	Dried apricots	1168201	Dried apricots
1162102	Dried figs	1162102	Dried figs	01168202	Prunes	1168202	Dried plums
1162103	Raisins and sultanas	1162103	Raisins and sultanas	01168203	Dried figs	1168203	Dried figs
1162104	Other dried fruits not described#	1162104	Other dried fruits not described	01168204	Raisins and sultanas	1168204	Raisins and sultanas

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
PROCESSED FRUITS							
DRIED FRUITS							
				01168205	Other dried fruits not described	1168205	Other dried fruits n.d.
						1169102	Processed pineapple
						1169103	Processed peach
						1169104	Processed pears
						1169105	Fruit purée
						1169107	Other processed fruits n.d.
						1169202	Other fruit based products n.d.
CANNED FRUITS							
1163103	Processed pineapple	1163103	Processed pineapple	01169105	Processed pears		
1163104	Processed peach	1163104	Processed peach	01169103	Processed pineapple		
1163105	Other processed fruits#	1163105	Other processed fruits	01169104	Processed peach		
				01169107	Other processed fruits		
				01169202	Other processed fruits and fruit-based products		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR FRUITS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
PROCESSED FRUITS							
FRUIT AND VEGETABLE JUICES						**FRUIT JUICES**	
1163201	Packed fruit juices	1163201	Packed fruit juice	01223101-01223102	Packed fruit juices	1223101	Fruit juices - 0,2 L (ceres, compal néctar, sumol néctar)
1163202	Other fruit juices in bulk#	1163202	Other fruit juices in bulk	01223103	Canned fruit juices	1223102	Fruit juices - 1 L (ceres, compal néctar, sumol nectar)
				01223104	Other packed fruit juices	1223103	Fruit juices - canned (ceres, compal néctar, sumol néctar)
						1223104	Other fruit juices n.d.
				01224101-01224102, 01224104	Packed vegetable juices	1223107*0.80	Fruit and Vegetable juices (including juices with added milk)1
				01224103	Packed vegetable juices#	1224101	Vegetable juices - 0,2L
						1224102	Vegetable juices - 1L
						1224104	Other vegetable juices - other packaging n.d.
						1223107*0.20	Fruit and Vegetable juices (including juices with added milk)1

For these codes no purchases were made by any of the participating households.

NOTES FOR FRUIT AND VEGETABLE JUICES:

FRUIT 1 - Code"1223107" (Fruit and Vegetable juices (including juices with added milk):80% fruit juice and 20% vegetable juice.

PORTUGAL – FOOD AGGREGATION TABLE FOR SUGAR PRODUCTS.

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SUGAR							
1181101	White sugar	1181101	White sugar	01181101	White sugar	1181101	White sugar
1181102	Brown sugar	1181102	Brown sugar	01181102	Brown sugar	1181102	Brown sugar
1181103	Other types of sugar not described#	1181103	Other types of sugar not described	01181103	Other types of sugar not described	1181103	Other types of sugar n.d.
SUGAR PRODUCTS							
HONEY						1182101	Honey
1101101	Honey	1101101	Honey	01182101	Honey	1182201	Quince jam
FRUIT JAMS						1182202	Other fruit jams
1101201	Pear marmalade	1101201	Pear marmalade	01182201	Cherry marmalade	1182204	Other sugary fruit based products n.d.
1101201	Pear marmalade	1101201	Pear marmalade	01182201	Cherry marmalade	1183101	Chocolate tablets
1101202	Peach marmalade	1101202	Peach marmalade	01182202	Orange jam	1183102	Chocolate tablets for cooking
1101203	Other jams and marmalades#	1101203	Other jams and marmalades	01182203	Strawberry marmalade	1183201	Chocolate sweets
1101204	Quince jam	1101204	Quince jam	01182204	Quince jam	1183202	Chocolate drops (smarties, m&m)
1101205	Other packed jams and marmalades#	1101205	Other packed jams and marmalades	01182205	Pear marmalade	1183203	Other chocolate sweets n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR SUGAR PRODUCTS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SUGAR PRODUCTS (continued)							
FRUIT JAMS						**SUGAR PRODUCTS (continued)**	
				01182206	Peach marmalade	1183301	Chocolate snacks - with caramel, biscuits, cereal (lions, twix)
				01182207	Other fruit jams and marmalades	1184101	Sugar or chocolate covered almonds
CHOCOLATES						1184102	Drop/candy, caramels, etc
1102102	Chocolate sweets	1102102	Chocolate sweets	01183101	Chocolate tablets	1184103	Chewing gums
1102103	Chocolates	1102103	Chocolates	01183102	Chocolate tablets for cooking	1169106	Glacé fruits
				01184102	Chocolate sweets	1116401	Cereal snacks (plain or with chocolate or fruit)
				01186105*200	Other sugar products not described (chocolate spread, etc.)[1]	1152102	Flavoured spreads (chocolate, hazelnut)
OTHER SUGAR PRODUCTS							
1102101	Sugar almonds	1102101	Sugar almonds	01184101	Sugar almonds		
1102104	Drops, candy, caramels, etc.	1102104	Drops, candy, caramels, etc.	01184103	Drops, candy, caramels, etc.		
1102105	Other candy products not described#	1102105	Other candy products not described	01169106	Glacé fruits		
1163106	Glacé fruits	1163106	Glacé fruits	01184105*13.7	Other candy products not described (small meringue, etc.)[2]		

For these codes no purchases were made by any of the participating household.

PORTUGAL – FOOD AGGREGATION TABLE FOR SUGAR PRODUCTS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SUGAR PRODUCTS (continued)							
OTHER SUGAR PRODUCTS						**SUGAR PRODUCTS (continued)**	
1163106	Glacé fruits	1163106	Glacé fruits	01184105*13.7	Other candy products not described (small meringue, etc.)[2]		
1101206	Fruit jellies	1101206	Fruit jellies				
1101208	Others fruit based sugar products not described#	1101208	Others fruit based sugar products not described				
1101304	Other sugar products not described#	1101304	Other sugar products not described				

For these codes no purchases were made by any of the participating households.

NOTES FOR SUGAR AND SUGAR PRODUCTS:

SUGAR-1 Code “01186105” (other sugar products not described, chocolatre spread, etc): Average weight per piece: 200 g.

SUGAR-1 Code “01184105” (other candy products not described, small meringue, bomboca, etc.): Average weight per piece: 13.7 g.

PORTUGAL – FOOD AGGREGATION TABLE FOR NON-ALCOHOLIC BEVERAGES.

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
STIMULANTS							
COFFEE AND SUBSTITUTES[1]						**COFFEE**	
COFFEE (caffeine)						1211101	Coffee beans - non instant
1191101	Coffee beans	1191101	Coffee beans	01211101	Coffee beans	1211102	Ground coffee - non instant
1191102	Ground coffee	1191102	Ground coffee	01211102	Ground coffee	1211103	Ground mixture of coffee with coffee substitutes - non instant
1191103	Ground mixture of coffee	1191103	Ground mixture of coffee	01211103	Ground mixture of coffee with coffee substitutes	1211201	Instant coffee - with caffeine
1191203	Instant coffee mixtures	1191203	Instant coffee mixtures	01211203	Instant mixtures of coffee with coffee substitutes	1211202	Instant coffee - without caffeine
1191201	Instant coffee with caffeine	1191201	Instant coffee with caffeine	01211201	Instant coffee with caffeine	1211203	Mixture of coffee with coffee substitutes - instant
		1191205	Other powdered soluble drinks with coffee			1211104	Coffee substitutes - non instant (chicoria, barley)
						1211204	Coffee substitutes - instant (chicoria, barley)
						1211301	Cappuccino
						1211302	Coffee and chocolate
SUBSTITUTES (no caffeine)						1211303	Other coffee based products n.d.
1191104	Coffee substitutes	1191104	Coffee substitutes	01211104	Coffee substitutes		

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR NON-ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SUBSTITUTES (no caffeine)						**Coffee (continued)**	
1191202	Instant coffee without caffeine	1191202	Instant coffee without caffeine	01211202	Instant coffee without caffeine		
1191204	Instant coffee substitutes	1191204	Instant coffee substitutes	01211204	Instant coffee substitutes		
TEA AND SIMILAR INFUSIONS[2]							
BLACK TEA						1212101	Black tea - plain
1192101	1212102	Black tea - with fruits or aromatized	Black tea	01212101	Black tea	1212102	Black tea - with fruits or aromatized
HERBAL AND FRUIT TEA						1212201	Green tea - plain
1192102	1212202	Green tea - with fruits or aromatized	Herbal tea	01212102	Herbal tea (chamomile, etc.)	1212202	Green tea - with fruits or aromatized
1192103	1212301	Herbal tea	Other teas not described	01212103	Fruit tea	1212301	Herbal tea
				01212104	Other tea		
COCOA[1]							
1193101	Cocoa powder	1193101	Cocoa powder	01213101	Cocoa powder	1213101	Cocoa powder
1193201	Chocolate powder	1193201	Chocolate powder	01213102	Chocolate powder	1213102	Chocolate powder
1193202	Powdered soluble cocoa products	1193202	Powdered soluble cocoa products	01213103	Powdered soluble cocoa products	1213103	Instant powdered cocoa products

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR NON-ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SOFT DRINKS							
COLA DRINKS						1222101	Cola - bottled 0,25L (coca-cola, pesi-cola)
1212101-1212103	1222102	Cola - bottled 0,33L (coca-cola, pesi-cola)	Cola	01222101-01222107	Cola	1222102	Cola - bottled 0,33L (coca-cola, pesi-cola)
OTHER SOFT DRINKS						1222103	Cola - bottled 1L (coca-cola, pesi-cola)
1163203*25	Other lyophilised products for cool drinks[3]#	1163203*25	Other lyophilised products for cool drinks[3]	01222108-01222115	Other soft drinks	1222104	Cola - bottled 1,5L (coca-cola, pesi-cola)
1101207*9	Syrups for cool drinks[4]#	1101207*9	Syrups for cool drinks[4]	01186104*9	Syrups for cool drinks[4]	1222105	Cola - bottled 5L (coca-cola, pesi-cola)
1212106,1212107	Fizzy orangeade	1212105-1212108	Fizzy lemonade	01194101*1000	Other food products not described elsewhere (powdered beverages)[5]	1222106	Cola - canned (coca-cola, pesi-cola)
1212104,1212105	Fizzy lemonade	1212109-1212112	Fizzy orangeade			1222107	Cola - other packaging n.d.
1212108	Other sparkling beverages not described#	1212113	Other sparkling beverages not described				
						1222108	Other soft drinks - bottled 0,25L
						1222109	Other soft drinks - bottled 0,33L
						1222110	Other soft drinks - bottled 1L
						1222111	Other soft drinks - bottled 1,5L
						1222112	Other soft drinks - bottled 2L

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR NON-ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SOFT DRINKS (continued)							
						1222113	Other soft drinks - canned
						1222114	Other soft drinks - other packaging n.d.
						1222115	Ice Tea
						1222116	Other soft drinks n.d. (energetic drinks)
						1223105*9	Syrups and concentrated fruits[6]
						1224105*9	Syrups and concentrated vegetables[6]
MINERAL WATER							
1211101-1211104	Bottled natural and mineral water	1211101-1211104	Bottled natural and mineral water	01221101-01221107	Bottled mineral water	1221101	Mineral water - non sparkling (bottled 0,25L)
						1221102	Mineral water - non sparkling (bottled 0,33L)
						1221103	Mineral water - non sparkling (bottled 0,5L)
						1221104	Mineral water - non sparkling (bottled 1L)
						1221105	Mineral water - non sparkling (bottled 1,5L)
						1221106	Mineral water - non sparkling (bottled 5L)

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR NON-ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MINERAL WATER (continued)							
						1221107	Mineral water - non sparkling (other packaging n.d.)
						1221201	Mineral water - sparkling (bottled 0,25L)
						1221202	Mineral water - sparkling (bottled 0,33L)
						1221107	Mineral water - non sparkling (other packaging n.d.)
						1221201	Mineral water - sparkling (bottled 0,25L)
						1221202	Mineral water - sparkling (bottled 0,33L)
						1221203	Mineral water - sparkling (bottled 0,5L)
						1221204	Mineral water - sparkling (bottled 1L)
						1221205	Mineral water - sparkling (bottled 1,5L)
						1221206	Mineral water - sparkling (bottled 5L)
						1221207	Mineral water - sparkling (other packaging n.d.)

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR NON-ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
MINERAL WATER (continued)							
						1221301	Mineral water - aromatized (bottled 0,25L)
						1221302	Mineral water - aromatized (bottled 0,33L)
						1221303	Mineral water - aromatized (bottled 0,5L)
						1221304	Mineral water - aromatized (bottled 1L)
						1221305	Mineral water - aromatized (bottled 1,5L)

For these codes no purchases were made by any of the participating households.

NOTES FOR NON-ALCOHOLIC BEVERAGES:
NONALCO-1 For conversion into liquid equivalents (ml), coffee and substitutes and cocoa were multiplied by 8.
NONALCO-2 For conversion into liquid equivalents (ml), tea and similar infusion were multiplied by 100.
NONALCO-3 Code "1163203" (lyophilized products for cool drinks): 40 g are used to prepare 1L of the final drink.
NONALCO-4 Code "01186104" and "1101205 up to 1212108"(fizzy lemonade and orangeade, and syrups for cool drinks): 100 ml of syrup are used to prepare 900 ml of the final drink.
NONALCO-5 Code "01194101" (other food products not described elsewhere, powdered beverages): 1 unit = 1 litre.
NONALCO-6 Code" 1223105" (Syrups and concentrated fruits) and "1224105" (Syrups and concentrated vegetables): 100ml is used to prepare 900ml of the final drink.

PORTUGAL – FOOD AGGREGATION TABLE FOR ALCOHOLIC BEVERAGES.

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
WINE							
1312101-1312103	White wine	1312101-1312103	White wine	02121101 - 02121104	White wine	2121101	White wine in bulk
1312104-1312106	Red wine	1312104-1312106	Red wine	02121105 - 02121108	Red wine	2121102	Bottled white wine - VQPRD
1312107-1312109	“Palhete” wine	1312107-1312109	“Palhete” wine	02121117 - 02121119	“Palhete” wine	2121103	Bottled white wine - regional
1312110-1312112	White “verde” wine	1312110-1312112	White “verde” wine	02121109 - 02121112	White “verde” wine	2121104	Bottled white wine - table ordinal
1312113-1312115	Red “Verde” wine	1312113-1312115	Red “Verde” wine	02121113 - 02121116	Red “Verde” wine	2121105	Tetra pack white wine - table ordinal
1312116	“morangueiro” wine	1312116	“morangueiro” wine	02121120	“Morangueiro” wine	2121106	Bottled white wine - 5L
1314101	Sparkling wine (natural)	1314101	Sparkling wine (natural)	02122201	Sparkling wine (natural)	2121107	White wine - other packaging
1314102	Sparkling wine (carbonated)	1314102	Sparkling wine (carbonated)	02122202	Sparkling wine (carbonated)	2121108	"Rosé" wine - in bulk
1314302	Other kinds of wine not described#	1314302	Other kinds of wine not described	02121121	Other kinds of wine not described	2121109	"Rosé" wine - bottled
						2121110	"Rosé" wine - other packaging
						2121111	Red wine in bulk
						2121112	Bottled red wine - VQPRD
						2121113	Bottled red wine - regional
						2121114	Bottled red wine - table ordinal

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
WINE (continued)							
						2121115	Tetra pack red wine - current
						2121116	Bottled red wine - 5L
						2121117	Red wine - other packaging
						2121118	"Verde" white wine in bulk
						2121119	Bottled "verde" white wine - VQPRD
						2121120	Bottled "verde" white wine - regional
						2121121	Bottled "verde" white wine - current
						2121122	Bottled "verde" white wine - 5L
						2121123	"Verde" white wine - other packaging
						2121124	"Verde" red wine in bulk
						2121125	Bottled "verde" red wine - VQPRD
						2121126	Bottled "verde" red wine - regional
						2121127	Bottled "verde" red wine - current
						2121128	Bottled "verde" red wine - 5L

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
WINE (continued)							
						2121129	"Verde" red wine - other packaging
						2121130	"Verde" "Rosé" wine - in bulk
						2121131	"Verde" "Rosé" wine - bottled
						2121133	"Palhete" wine in bulk
						2121134	Bottled "palhete" wine
						2121135	Bottled "palhete" wine - 5L
						2121136	"Morangueiro" wine
						2121137	Other wines n.d.
BEER							
ALCOHOLIC BEER						2131101	Bottled white beer 0,20L
1313101-1313104	White beer	1313101-1313104	White beer	02131101 - 02131106	White beer	2131102	Bottled white beer 0,25L
1313201	Black beer	1313201+1313202	Black beer	02131107 - 02131111	Black beer	2131103	Bottled white beer 0,33L
1313202	Black beer#			02131112	Black beer#	2131104	Canned white beer 0,33L
						2131105	Canned white beer 0,44L

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
BEER (continued)							
NON-ALCOHOLIC BEER						2131105	Canned white beer 0,44L
		1213101	Non alcoholic beer	02131201	Non alcoholic white beer	2131106	Bottled white beer 0,5L
				02131202	Non alcoholic black beer	2131107	Canned white beer 0,5L
						2131108	Bottled white beer 1L
						2131109	White beer - other packaging
						2131110	Bottled black beer 0,20L
						2131111	Bottled black beer 0,33L
						2131112	Canned black beer 0,33L
						2131113	Canned black beer 0,5L
						2131114	Bottled black beer 1L
						2131115	Black beer - other packaging
						2131116	Other alcoholic beers n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
BEER (continued)							
						2131201	Non alcoholic white beers
						2131202	Non alcoholic black beers
						2131203	Other non alcoholic beers n.d.
SPIRITS							
1311101	White Brandy	1311101	White Brandy	02122101	White Brandy	2111101	Aniseed liqueurs
1311102	Cognac, Brandy	1311102	Cognac, Brandy	02122102	Cognac, Brandy	2111102	Morello cherry brandy
1311103	Whisky	1311103	Whisky	02122103	Whisky	2111103	Cream liqueurs
1311104	Other alcoholic beverages (Gin, Vodka, etc.) #	1311104	Other alcoholic beverages (Gin, Vodka, etc.)	02122104	Other alcoholic beverages (Gin, Vodka, etc.)	2111104	Other liqueurs n.d.
1314401	Aniseed liqueur	1314401	Aniseed liqueur	02111101	Aniseed liqueur	2111201	White brandy
1314402	Morello cherry brandy	1314402	Morello cherry brandy	02111102	Morello cherry brandy	2111202	Cognac, brandies
1314403	Other liqueurs not described#	1314403	Other liqueurs not described	02111103	Other liqueurs not described	2111203	Whisky
1314501	Cider#	1314501	Cider	02111201	Madeira Island wine	2111204	Gin
1314201	Madeira Island wine#	1314201	Madeira Island wine	02111202	Port wine	2111205	Vodka
1314202	Port wine	1314202	Port wine	02111203	Other liqueur, sweet wines	2111206	Rum

For these codes no purchases were made by any of the participating households

PORTUGAL – FOOD AGGREGATION TABLE FOR ALCOHOLIC BEVERAGES (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
SPIRITS (continued)							
1314203	Other liqueur, sweet wines#	1314203	Other liqueur, sweet wines	02122301	Vermouth (Cinzano, Martini, etc.)	2111207	Low alcohol content spirits (Bacardi Breezer, Smirnoff Ice)
1314301	Vermouth (Cinzano, Martini, etc.)	1314301	Vermouth (Cinzano, Martini, etc.)	02122302	Other alcoholic beverages	2111208	Other spirits n.d.
						2121201	Madeira wine
						2121202	Port wine
						2121203	Moscatel wine
						2121204	Other liqueurs wines n.d.
						2121301	Wines of other fruits (cider)
						2122101	Champagne
						2122102	Sparkling wine (natural)
						2122103	Sparkling wine (carbonated)
						2122201	Cinzano, Martini, etc
						2122202	Other alcoholic beverages based on wine n.d.

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MISCELLANEOUS FOODS.

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FOOD ITEMS							
BABY FOOD						1116301	Baby products based on cereal flours
1116106	Flour (to be made with water) - baby cereal	1116106	Flour (to be made with water) - baby cereal	01115201	Flour (to be made with water) - baby cereal	1146202	Milk based desserts for baby
1116107	Breakfast and baby cereal not described#	1116107	Breakfast and baby cereal not described	01115207	Flour based products for babies	1169201	Processed fruit based products for baby
				01115202	Breakfast and baby cereal not described	1176206	Vegetable based products for baby
1142204	Powdered milk-special for children	1142204	Powdered milk-special for children	01143203	Powdered milk – special for babies	1182203	Fruit based desserts for baby
SPICES						1193401	Ready made meals for baby (except fruit)
1103101	Cinnamon	1103101	Cinnamon	01192201	Powdered garlic	1223106	Baby fruit juices (bottled or tetra pack)
1103102	Paprika	1103102	Paprika	01192202	Cinnamon	1143202*8	Powdered milk – for baby[1]
1103106	Pepper	1103107	Pepper	01192203	Paprika	1181201	Artifitial Sweetners (canderel, hermezetas)
1103110	Other seasonings and spices not described#	1103111	Other seasonings and spices not described	01192205	Pepper	1192101	Cooking salt
				01192206	Other seasonings and spices not described	1192102	Table salt
AROMATIC HERBS						1192201	Powdered garlic
1103103	Aromatic herbs	1103103	Aromatic herbs	01192204	Aromatic herbs	1192202	Cinnamon

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MISCELLANEOUS FOODS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FOOD ITEMS (continued)							
PACKED SAUCES						1192203	Paprika
1103104	Other packed sauces	1103104	Mayonnaise	01191102	Mayonnaise	1192204	Aromatic herbs
1103105	Mustard	1103105	Other packed sauces	01191104 01191101	Other packed sauces Ketchup	1192205	Pepper
		1103106	Mustard	01191103	Mustard	1192206	Bay leaf
SALT						1192207	Saffron
1103107	Cooking salt	1103108	Cooking salt	01192101	Cooking salt	1192208	Curry
1103108	Table salt	1103109	Table salt	01192102	Table salt	1192209	Other spices n.d.
VINEGAR						1191102	Mayonnaise
1103109	Vinegar	1103110	Vinegar	01191105	Vinegar	1191103	Mustard
***KNORR* CUBES**						1191104	Other sauces n.d.
1127102	Knorr meat and chicken cubes	1127102	Knorr meat and chicken cubes	01134308	Knorr fish cubes	1191105	Vinegar
		1135107	Knorr Fish cubes	01126108	Knorr meat cubes	1152103	Other spreads n.d.
INSTANT DESSERTS						1186101	Cooking gelatines
1101301	Gelatines#	1101301	Gelatines	01186101	Gelatines	1186102	Products for instant desserts (mousses, puddings, creams, cakes)

For these codes no purchases were made by any of the participating households.

PORTUGAL – FOOD AGGREGATION TABLE FOR MISCELLANEOUS FOODS (continued).

Household Budget Survey 1989-1990		Household Budget Survey 1994-1995		Household Budget Survey 2000-2001		Household Budget Survey 2005-2006	
FOOD ITEMS (continued)							
INSTANT DESSERTS						1194101	Aperitifs (pop-corn, canapés, cheetos)
1101301	Gelatines#	1101301	Gelatines	01186101	Gelatines	1193101	Ready made yeasts
1101302	Instant mousse#	1101302	Instant mousse	01186103	Instant mousse	1193301	Knorr cubes
1101303	Instant pudding and creams#	1101303	Instant pudding and creams	01186102	Instant pudding and creams	1193201	Instant soups
OTHER FOOD ITEMS						1186103	Other sugar based products n.d
1104102	Other food products not described elsewhere#	1104102	Other food products not described elsewhere	01115208	Other cereal based products (popcorn, canapés, aperitifs)	1184104	Other confectionery n.d.
				01184104	Chiclets	**DISHES**	
				01193101	Ready made yeasts (for dough and bread, for example)	1194102	Ready to eat meals (hot, refrigerated - cooked daily)
				01115301	Cereal based dietetic products	1194103	Ready to eat meals (canned, frozen)
						1194104	Other food products not described elsewhere
						1147301	Egg based desserts
						1147302	Other egg based products n.d.

For these codes no purchases were made by any of the participating households.

Anexo 3: Classificação da variável sociodemográfica nível de urbanização conforme critérios DAFNE-ANEMOS

Harmonização das definições dos níveis de urbanização do local do domicílio - Inquéritos aos Orçamentos Familiares (IOF), Portugal –edições de 1989/1990, 1994/1995, 2000/2001, 2005/2006.

Descrição	IOF 1989-1990	IOF 1994-1995	IOF 2000-2001	IOF 2005-2006
Variável na base de dados	dimlocal	rururb	rur_urb	GU-ine
Rural	1 (< 2000 habitantes)	3 (agregados não classificados como semi-urbanos ou urbanos)	1 (grupo ou comunidade não pertencente as áreas urbana e semi-urbana)	3(áreas não pertencentes as áreas urbana e semi-urbana)
Semi-urbana	2 (2000-9999 habitantes)	2 (2000-5000 habitantes ou densidade populacional 100-500/habitantes/Km^2)	2 (grupo ou comunidade com densidade populacional 100-500/habitantes/Km^2 não pertencente área urbana ou periférica)	2 (popualção ≥ 2000 e < 5000 habitantes ou com densidade populacional 100 ≤500 e >100 habitantes/Km^2)
Urbanas	3 (≥ 10000-30000 habitantes)	1 (≥ 5000 habitantes ou densidade populacional > 500/habitantes/Km^2)	3 (grupo ou comunidade com população superior a 50000 e densidade populacional > 500/habitantes/Km^2)	1 (população ≥ 5000 habitantes ou densidade populacional > 500/habitantes/Km^2)
	4 (≥ 30000 habitantes)			