Time spent for food information search and obesity: North-South dualism in Italy

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Paper prepared for presentation at the EAAE 2011 Congress
Change and Uncertainty
Challenges for Agriculture,
Food and Natural Resources

August 30 to September 2, 2011
ETH Zurich, Zurich, Switzerland

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Abstract – In industrialized countries, the last 40 years has seen a marked change in the average level of per capita calorie intake, which has led to increased growth in overweight and obesity rates. There are many reasons to encourage public intervention aimed at facing the problems associated with excess body weight, and to promote healthy dietary habits. Among the public policies set out to reduce obesity rates, an important role is played by information measures. The purpose of this work is to analyse for the consumers the importance of food information in the allocation of free time, and to investigate the variables that affect the search for information. Following Drichoutis et al. (2008) we developed a conceptual framework through variables that affect the time spent searching for information. The study was conducted through an empirical analysis, and the sample consisted of 300 Italian consumers, 150 resident in Lombardy (northern Italy), and 150 in Apulia (southern Italy). The interviews were conducted in small shops, supermarkets and hypermarkets. For small shops we selected greengrocers, butcher's shops and shops selling dairy products. The data were analysed through OLS regression and ordinal regression models. The study, for the south sample, showed a relationship between the consumer willingness to devote time to information search and work flexibility, information stock, nutritional knowledge. In the case of northern sample, another variable that affects the time allocated for information search is BMI.

1. Introduction

Over the last 40 years in industrialized country there has been a change in the average levels of intake of calories per capita, which has led to growth in overweight and obesity rates (Schmidhuber and Shetty, 2005). According to WHO, in 2005 overweight individuals (over 15 years of age) appear to be 1.6 billion and among these 400 million are obese (WHO, 2006). In Italy, according to the annual household survey multiscope ISTAT (2007), almost the 45.5% of adult Italians have a problem of overweight and 10% are obese (Moro, 2009). In addition, Italy has a record among European countries with regard to the incidence of overweight and obesity in children (according to the standards of the International Obesity Task Force, 1 child in 3), outlining a possible significant rise in related nutritional diseases in the near future (Lobstein and Frelut 2003).

Many reasons encourage the implementation of public intervention aimed at facing problems associated with excess body weight and at promoting healthy dietary habits. These reasons include asymmetrical information between consumer and producer and negative externalities linked to obesity costs. The negative externalities associated with the spread of an unhealthy diet have lead public authorities to take an important role by intervening where markets have failed. Among the public policies aimed at reducing obesity rates we cite information measures, information campaigns, advertising regulations, nutritional education programs in schools, nutritional information on menus and the regulation of nutritional claims, all of which play an important role.

Indeed, an uninformed consumer is not able to optimize his preferences and can make unhealthy choices. Thus, it is important to put a clear message on food packaging and to educate consumers so they have a sufficiently high level of education to understand the nutritional information to thus limit unhealthy choices (Drichoutis et al. 2005 and 2008). Several studies have shown that inadequate information prevented consumers from making informed choices favouring an increase of obesity.

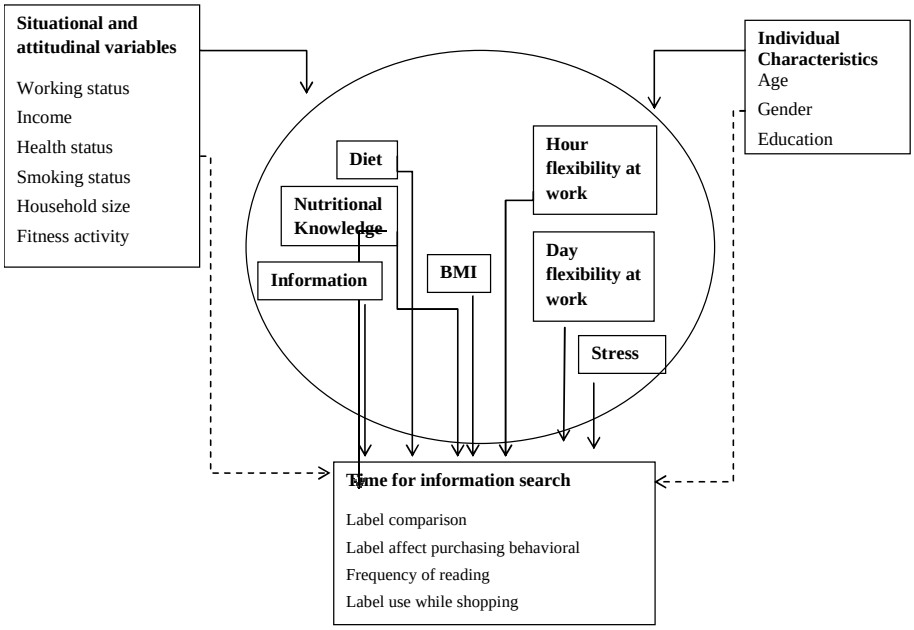
In this way, labelling plays an important role for promoting informed choices. In USA, for example, a recent analysis revealed that nutritional labelling is connected with low levels of BMI (Variyam, 2008). Nutrition labelling must be seen by consumers as “assistance” in the buying process, helping them decide the nutritional characteristics of food (Senauer et al., 1991).

The purpose of this work is to analyse for the consumer the importance of food information in the allocation of free time and to investigate the variables that affect the time allocated to information search. In other words, consumers can allocate their free time to different activities: the greater the interest consumers show towards being informed about food products, the more time they will allocate for this type of activity with respect to other activities.
The work is organised as follows: the second section shows some of the most important contributions concerning consumer behaviour, and provides the literature background of economic issues related to nutritional information search; section 3 describes the method and the empirical model utilised, whereas section 4 reports and evaluates the results of the empirical analysis; section 5 set down the concluding remarks.

2. Economic issues

The main cost of using nutritional label or searching for information is the willingness to devote time to reading and reacting to labelling information. The benefits may be reflected in better choices and healthy diets, which in turn can be perceived as reduced risk of chronic diseases because of the diet–health relationship that continues to gain scientific support (Nayga, 2000). Several studies have generally found that nutritional label use can improve dietary outcome. The literature for the US suggests that nutritional label use provides some dietary benefits and increased use of nutritional labels has been associated with healthier patterns of dietary behavior (Coulson, 2000).
According to Grossman, who introduced the concept of health capital, we consider label use to be a health enhancing activity. Health, in the Grossman's model, is a capital good. Each individual has an initial stock of health capital that depreciates with age, and can be increased by investment. Therefore, according to Becker, time and not income is a constraint for human choice (Shogren, 2005). The time constrain approach implies that consumer can make a choices concerning the allocation of time for shopping, fitness activity and so on (Becker, 1965).
Thus, the investment in health includes the time spent by consumers searching for information concerning medical care, diet, fitness activity. In this paper we used the economic model of information search developed by Drichoutis et al. (2008), where information search is linked to label use. In this model the time that consumer spends reading nutritional labels is part of his food choice process.
Following Drichoutis et al. (2008) we developed a conceptual framework through variables that affect the time spent searching for information (Fig. 1). The first group of variables concerns the time pressure at work and includes variables concerning the flexibility and the level of stress. Many studies have investigated the role of time pressure as a limitation for information search (Beatty and Smith, 1987; Feick, Herrmann, and Warland, 1986; Katona and Mueller, 1955; Park, Iyer, and Smith, 1989). Stress at work can limit the time spent for information search. Consequently, flexidays and flexitime are included in the model to capture the time pressure effect.
Furthermore, studies show that diet quality has a positive effect on search information concerning food products. Consumers, who follow a particular diet, maybe because have a special medical situation or for their general diet awareness, consider the use of nutritional label very important. Therefore, consumers who perceived diet quality to be important to their health and lifestyle are more likely to invest their free time by allocating it to information search (Derby and Fein, 1994; Feick, Herrmann, and Warland, 1986; Kim, Nayga, and Capps, 2001a; Nayga, 2000; Szykman, Bloom, and Levy, 1997; Wang, Fletcher, and Carley, 1995).
Furthermore, many studies showed that higher levels of nutritional knowledge can facilitate label use and information search and improve comprehension efficiency. Indeed, Drichoutis et al. (2008) found that having general knowledge of the principles of nutrition facilitates and encourages label use. Consumers with higher efficiency in reading nutritional information exhibit a higher stock of nutrition information deriving from this type of source.

Fig. 1 - Conceptual framework for the analysis



Moreover, it is interesting to note that high levels of BMI are more elevated when consumers have insufficient information to make more aware choices; in fact, the effectiveness of the nutritional labels has been associated with a decrease in obesity (Variyam et al., 2006; Drichoutis et al., 2005).
Finally, we assumed that a set of individual consumer's characteristics (age, gender, education) and situational and attitudinal variables (working status, income, health status, smoking status, household size, fitness activity) could affect the early described variables.

3. Methodological issues

The analysis focuses on the Italian population. In Italy, the gap in terms of socio-economic conditions between the northern and southern regions could affect the results of the study. For this reason, our empirical analysis takes into account one region of the North and one in the South of Italy. This choice is also justified by the fact that there are significant differences in terms of obesity rates between northern and southern regions of Italy.
The survey was conducted in July 2010 and the sample is composed by 300 Italian consumers, 150 resident in Lombardy, and 150 in Apulia. We used an ad hoc questionnaire and we pre-tested it on a small sample of consumers in May 2010.
The interviews were conducted in small shops, supermarkets and hypermarkets. For small shops we selected greengrocers, butcher's shops and shops selling dairy products. The selection of each type of retailer was done randomly from the geographic regions.
The survey was carried out over week long periods, during the mornings and afternoons of both weekdays and weekends. Consumers were approached randomly and asked to participate in the survey. In the sample selection we took into account the shop size, considering 2 stores for hypermarkets, 5 for supermarkets and 10 among butchers, greengrocers and dairies. The consumers surveyed were 50 for each type of shop (50 consumers for hypermarkets, 50 for supermarkets and 50 for traditional retailers).
The questionnaire was consisted of 21 questions. The answers to the questions are arranged in a multiple-choice format with rating or dichotomic scales.

According to recent economic literature and our conceptual framework the questionnaire is divided in five sections:

- allocation of time for information search;
- characteristics of work;
- dietary and healthy life attitude;
- individual characteristics;
- situation and attitudinal variables.

Definitions, means, and standard deviations of all variables employed in the model are reported in table 1.

Tab. 1 - Variable definition

Variable name	Scale	Description	N	Mean	SD
Time for information search					
Label comparison	1-4	Respondent compares the labels of different food product	299	2.40	0.79
Label affect purchasing behavioural	1-4	Respondent uses nutritional labelling on purchasing decision	300	2.43	0.77
Frequency of reading	1-4	Respondent read the labels frequently	300	2.31	0.85
Label use while shopping	1-4	Respondent uses nutritional labelling while shopping	300	2.39	0.84
Label use at home	1-4	Respondent uses nutritional labelling at home	300	1.89	0.77
Characteristics of work					
Flexitime *(FT)*	1-3	Flexitime hour at work (from 1 no flexible at 3 very flexible)	221	1.75	0.75
Flexiday *(FD)*	1-3	Flexiday at work (from 1 no flexible at 3 very flexible)	219	1.58	0.68
Stress *(S)*	0-3	Stress at work (from 0 no stress to 3 very stressful)	300	0.60	0.78
Dietary and healthy life attitude					
Fitness activity *(FA)*	0-1	Respondent practices sport once a week 1; otherwise 0	276	0.72	0.45
Quality diet *(QD)*	0-10	Mediterranean Diet)	300	6.61	1.53
Nutritional knowledge *(NK)*	0-5	Level of knowledge considering 5 questions on principal nutrient items (cholesterol, fiber, proteins, fat, vitamins)	300	3.89	1.15
Information stock *(IS)*	0-6	Level of information considering 6 questions on principally recommendation and link between nutrients and cardio vascular disease	300	4.06	1.31
BMI	continue	Body Mass Index	299	25.57	4.93
Individual Characteristics					
Age *(AGE)*	1-6	The interviewee's age group (18-24; 25-34; 35-44; 45-54; 55-64; >64)	300	3.59	1.45
Gender *(SEX)*	0-1	1 female, 0 male	300	0.58	0.49
Education *(EDU)*	1-4	Education levels (primary school, secondary school, higher education, degree)	295	2.78	0.88
Situational and attitudinal variables					
Income *(INC)*	1-5	Household income (< 500€; 500-1000€; 1000-2000€; 2000-3000€; >3000€)	299	3.67	0.91
Working status *(WS)*	0-1	1 employed, 0 otherwise	300	0.60	0.49
Household size *(SIZE)*	1-5	Family members (from 1 to > over 4)	300	3.22	1.14
Smoking status *(SS)*	0-1	Respondent does not smoke 1; otherwise 0	300	0.45	0.50
Health status *(HS)*	1-5	Self-perception of overall health (from very well to vary bad)	300	2.27	0.76

Before estimating the equations, specified below, we used Principal Components Analysis (PCA) to reduce the variables regarding information search into a factor. The factor result from the PCA was utilized as dependent variable.

The data were analysed through OLS regressions, where the aim of equation is to test the hypotheses of the theoretical model.

In accordance with recent literature concerning consumers and nutrition information (e.g., Nayga, 1996; Drichoutis et al., 2005), we hypothesise the following functional relationship among the variables:

H_1: Consumers with low time pressure level, not so stressed, are more likely to allocate time for information search

H_2: Consumers who perceive diet quality important for their lifestyle are more likely to allocate their free time to information search

H_3: Consumers with high level of nutritional knowledge are more likely to allocate their free time to information search

H_4: Consumers with high level of information stock are more likely to allocate their free time to information search

H_5: Consumers with high level of BMI are more likely to allocate their free time to information search

To test these hypotheses we use the following equation:

$$T = \beta_0 + \beta_1 FT + \beta_2 FD + \beta_3 S + \beta_4 IS + \beta_5 QD + \beta_6 NK + \beta_7 BMI + \varepsilon_1$$

Where:
T= time spent for information search;
FT= flexitime;
FD= flexiday;
S= stress;
IS= information stock;
QD= quality diet;
NK= nutritional knowledge;
BMI= body mass index.

To measure the time spent for information search (T) we asked the consumers if they compare the labels of the different food products, if the nutritional labels affect their purchase decision, how often they use nutritional labels and where they read the labels, while shopping or at home. We used these variables in the PCA and obtained one factor regarding the consumers' time for information search (T).
Occupational stress has a negative impact on worker health. Job strain occurs when job stress is high and power decision is low. Excessive commitments of the job can be associated with strong work pressure caused by the execution of tasks at high speed and by being subjected to tight deadlines. Therefore, working respondents were asked how often they face tight deadlines, how often they have to work at fast pace and how often they can change their work goals (S). To analyse the job characteristics in terms of work flexibility we asked respondents if working days (FD) and working hours (FT) are inflexible, somewhat flexible or very flexible.
The variable information stock (IS) is an index to measure the level of knowledge about diet-disease relationship. For each correct answer the respondents were assigned a score of 1 and a score of 0 for an incorrect answer, thus yielding a score between 0 and 6 for each respondent.
For the variable quality diet (QD) we constructed a scale, according to Trichopoulou et al. (2003) were we asked respondents their consumption frequency for each of 10 food items, chosen to represent the major food group of the Mediterranean-diet pyramid. Possible answers were never, 1 or 2 times a month, once a week, 3 or 4 times a week, once a day, few times a day. For healthy components (fruit, cereals, vegetables, fish, pulses, olive oil) individuals with consumption below the average were assigned 0, and those with consumption at or above the average were assigned value 1. For components presumed to be harmful (meat, cheese, eggs, sweets), individuals with a consumption below the average were assigned a value of 1, and those whose consumption was at or above the average were assigned value 0. Thus, the total Mediterranean Diet Score ranged from 0 (minimal adherence to the traditional Mediterranean diet) to 10 (maximal adherence).
To measure nutritional knowledge (NK) we asked a set of questions that measure a consumer's knowledge of the specific nutrient content on comparing certain foods. We set up an index, from 0 to 5, where each correct answer was assigned a score 1 while incorrect answer were assigned a score of 0. We used questions about the content of cholesterol, proteins, fiber, fat and vitamins.
Respondents were also asked to report their body weight and height and these were used to calculate the Body Mass Index (BMI) calculated as weight (Kg) divided by height squared (m^2). Individuals with a BMI over 30 were classified as obese, those with a BMI between 25 and 30 overweight, those with a BMI between 18.5 and 25 were considered normal weight and those with a BMI under 18.5 underweight.

Moreover we analyse the role of individual characteristics and situational and attitudinal variables to explain the dietary and healthy attitude and work characteristics.
For this reason, after the OLS estimation, a set of ordinal regression models was carried out, where the dependent variables were represented by the above explained variable. The independent variables are represented by individual characteristics (age-AGE, gender-SEX, education-EDU) and situation and attitudinal variables. These second group includes variables like income (INC), working status (WS), household size (SIZE), smoking status (SS), self-evaluation of health (HS), and fitness activity (FA).

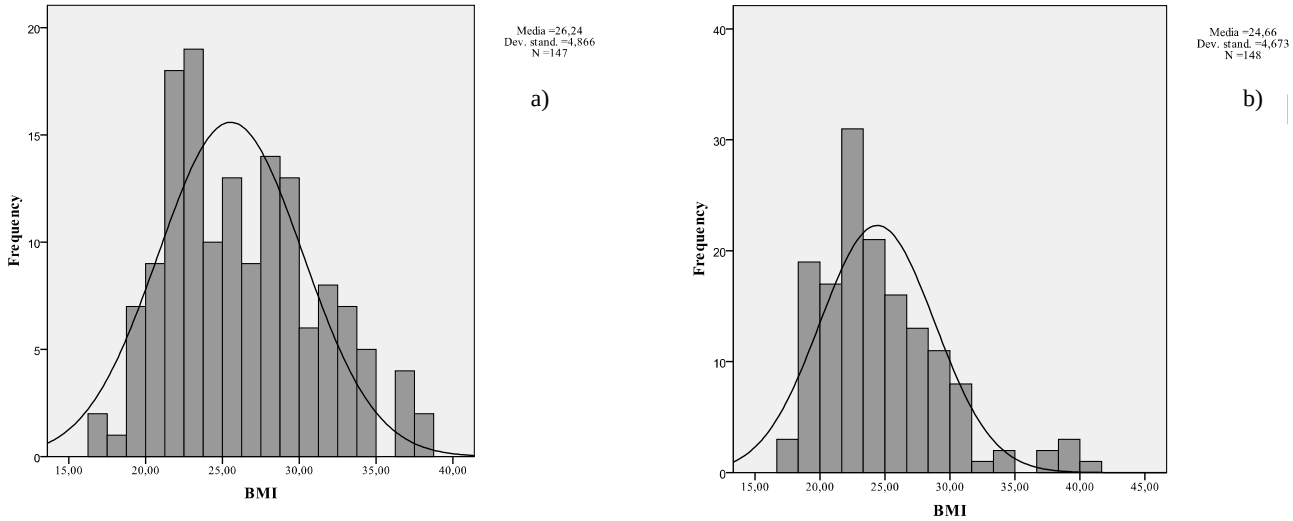
$$BMI = \gamma_0 + \gamma_1 AGE + \gamma_2 SEX + \gamma_3 EDU + \gamma_4 INC + \gamma_5 WS + \gamma_6 SIZE + \gamma_7 SS + \gamma_8 HS + \gamma_9 FA + \varepsilon_2$$
$$NK = \delta_0 + \delta_1 AGE + \delta_2 SEX + \delta_3 EDU + \delta_4 INC + \delta_5 WS + \delta_6 SIZE + \delta_7 SS + \delta_8 HS + \delta_9 FA + \varepsilon_3$$
$$IS = \vartheta_0 + \vartheta_1 AGE + \vartheta_2 SEX + \vartheta_3 EDU + \vartheta_4 INC + \vartheta_5 WS + \vartheta_6 SIZE + \vartheta_7 SS + \vartheta_8 HS + \vartheta_9 FA + \varepsilon_4$$
$$QD = \mu_0 + \mu_1 AGE + \mu_2 SEX + \mu_3 EDU + \mu_4 INC + \mu_5 WS + \mu_6 SIZE + \mu_7 SS + \mu_8 HS + \mu_9 FA + \varepsilon_5$$
$$S = \pi_0 + \pi_1 AGE + \pi_2 SEX + \pi_3 EDU + \pi_4 INC + \pi_5 WS + \pi_6 SIZE + \pi_7 SS + \pi_8 HS + \pi_9 FA + \varepsilon_6$$
$$FT = \sigma_0 + \sigma_1 AGE + \sigma_2 SEX + \sigma_3 EDU + \sigma_4 INC + \sigma_5 WS + \sigma_6 SIZE + \sigma_7 SS + \sigma_8 HS + \sigma_9 FA + \varepsilon_7$$
$$FD = \tau_0 + \tau_1 AGE + \tau_2 SEX + \tau_3 EDU + \tau_4 INC + \tau_5 WS + \tau_6 SIZE + \tau_7 SS + \tau_8 HS + \tau_9 FA + \varepsilon_8$$

4. Results

4.1 Descriptive analysis

The BMI distribution highlights, according to national statistical data, a different rate between the two investigated regions. The differences especially regard the obesity rate which is the highest for the southern regions. In the northern sample obese consumers represented 7% of those interviewed, while for the south about 17% were obese. Also the overweight rates are different, 28% for the south and 32.9% for the north. Figure 2 shows a non-parametric estimate of the BMI distribution. It is a normal distribution with an average around a BMI value of 26.2 for the south and 24.6 for the north.

Fig. 2 - BMI distribution in the sample (a–south; b–north)



Source: own survey

Regarding the part of the questionnaire that evaluates the different free time allocation of the two analysed regions, the results show that the total sample considered label use important, but not fundamental to the behaviour process. The distributions of responses to the five label use questions are seen in Table 2. The total sample shows that for all the considered variables there is a propensity of the interviewer to answer sometimes. This choice for all the variable is about 50% and in some cases the percentage was higher.
Among the northern consumers about the 38% of the respondents answered either often or always to the questions, while only 34.7% of the southern respondents answered in this way. Regarding the place where the labels was read: the majority of northern consumers use the labels while shopping, 46.7% answered often and always, while 30.7% use the labels at home often and always. In the south, 38% of those interviewed use, often and always, labels while shopping; and only 4.7% read the label at home.
Those interviewed who compare labels of different food products: often and always by 48% of the northern consumers, and 22.9 of the southern. The label affects the purchasing behaviour of 46% of northern consumers and 43.3% of southern consumers.

Tab. 2 - Time spent searching for information in two areas of investigation

		North		South		Total	
		n	*%*	*n*	*%*	*n*	*%*
Label comparison	Never	20	13.3	2	1.3	22	7.4
	Sometimes	58	38.7	113	75.8	171	57.2
	Often	41	27.3	29	19.5	70	23.4
	Always	31	20.7	5	3.4	36	12.0
Label affect purchasing behavioural	Never	25	16.7	3	2.0	28	9.3
	Sometimes	56	37.3	82	54.7	138	46.0
	Often	52	34.7	59	39.3	111	37.0
	Always	17	11.3	6	4.0	23	7.7
Frequency of reading	Never	38	25.3	8	5.3	46	15.3
	Sometimes	55	36.7	90	60.0	145	48.3
	Often	40	26.7	40	26.7	80	26.7
	Always	17	11.3	12	8.0	29	9.7
Label use while shopping	Never	27	18.0	13	8.7	40	13.3
	Sometimes	53	35.3	80	53.3	133	44.3
	Often	52	34.7	45	30.0	97	32.3
	Always	18	12.0	12	8.0	30	10.0
Label use at home	Never	44	29.3	53	35.3	97	32.3
	Sometimes	60	40.0	90	60.0	150	50.0
	Often	37	24.7	6	4.0	43	14.3
	Always	9	6.0	1	0.7	10	3.3

Source: own survey

4.2 Estimation results

Due to the complexity of the elements influencing the individual time allocated for information search and for the nature of the data, the R^2 is relatively low. No degrading multicollinearity problems were detected from the data based on the collinearity diagnostic tests conducted (Belsley, Kuh, and Welsch 1980).
The results of the OLS model (tab. 3) for the consumers of the south show a positive and significant coefficient for variable *flexitime* and a negative one for *flexiday*. The variable *stress* is not significant in the model. Therefore, consumers who have a high level of flexibility in term of time are more likely to invest time in information search. On the other hand, we found that the consumers in the north more likely to invest their time in information search are those with a higher level of day-flexibility. Thus, we found only partial support for the first hypothesis H_1.

Tab. 3 - Factors affecting the time for information search in the sample

	SOUTH		NORTH	
	β		β	
α	-2.167		-0.511	
	0.984		*(0.876)*	
Flexitime	0.512	*	0.111	
	(0.280)		*(0.138)*	
Flexiday	-0.478	**	0.268	*
	(0.285)		*(0.150)*	
Stress	0.045		0.149	
	(0.112)		*(0.108)*	
Quality diet	0.093		-0.064	
	(0.066)		*(0.066)*	
Nutritional Knowledge	0.233	***	-0.019	
	(0.076)		*(0.103)*	
Information Stock	0.243	**	0.244	***
	(0.106)		*(0.084)*	
BMI	-0.018		-0.031	*
	(0.021)		*(0.017)*	
Observation	150		150	
R- squared	0.286		0.174	

Note: OLS regressions with robust standard errors in round brackets .
***,** ,*: significant at 1, 5 and 10 percent level, respectively.
Source: own survey

The *quality diet* variable is not significant in either model, contradicting our hypothesis. Thus, hypothesis H_2 is rejected.
It is interesting to note that in the model for the south we find a positive and significant relation between *nutritional knowledge* and time. A higher level of nutritional knowledge can help the consumer in the process of choice towards healthy food products. Therefore, this can encourage the consumer to devote time to information search. In the model for the north this variable is not significant, but for southern consumers our hypothesis H_3 holds.
A high level of information stock is related to major time for allocation to information search, thus our hypothesis H_4. In both models, the sign of the coefficient of *information stock* variable is positive and significant. The results indicate that, as for the nutritional knowledge, a higher level of information stock will increase the time to devote to information search. Knowledge of the general principles of nutrition can facilitate the acquisition of specific nutrition information and encourage the consumer to utilise this information.
The last variable taken into consideration in our model is the *BMI*. The results show an inverse relationship between time for information and BMI for the northern consumers. This could be due to the fact that obese people tend to be less interested in information activity, and accordingly allocate it only a short time, thus rejecting the fifth hypothesis of the model H_5. This relationship is not easily identifiable as there can be a problem of endogeneity; in fact it is likely that a lack of attention to nutritional values could be at the basis of increases in BMI.
Furthermore, we analysed the influence of socio-demographic and economic characteristics on some of the independent variables used in the above equations.
For this reason, after estimating the OLS model, we analysed the relation between Flexitime, Flexiday, Stress, Quality diet, Nutritional Knowledge, Information stock, BMI, and the variables concerning individual characteristics and situational and attitudinal variables. Each relation was tested with ordinal regression models, considering the nature of the independent variables (ad except for the BMI that is a continue variable). The result for the south suggests the following aspects (tab. 4):

- the possibility of being overweight or obese is highest among the male, in the large size household, in people with a negative perception of health status and among those that practice fitness activity regularly;
- the level of nutritional knowledge is highest among consumers with high level of education and income, and a good perception of health status;
- the level of information stock is highest among consumers that do not smoke and who have a negative perception of health status;
- a good quality of diet is highest among the older age group, and people who have a good perception of health status;
- male are the most stressed consumers;
- more flexibility in time is highest among high income and no smoking consumers;
- greater day flexibility is highest among the male and consumers who do not smoke.

Tab. 4 - The role of individual characteristics and situational and attitudinal factors for the southern consumers

	BMI	Nutritional Knowledge	Information Stock	Quality diet	Stress	Flexitime	Flexiday
Age	-0.326	0.051	0.085	0.410 ***	-0.105	0.282	-0.050
	(0.292)	*(0.151)*	*(0.150)*	*(0.150)*	*(0.175)*	*(0.222)*	*(0.222)*
Gender	-2.234 ***	-0.180	-0.248	0.496	-0.834 **	-0.465	-0.984 *
	(0.655)	*(0.346)*	*(0.340)*	*(0.335)*	*(0.406)*	*(0.502)*	*(0.524)*
Education	-0.379	0.935 ***	0.261	0.126	-0.103	0.440	0.555
	(0.530)	*(0.288)*	*(0.275)*	*(0.269)*	*(0.329)*	*(0.440)*	*(0.454)*
Income	-0.553	0.498 *	-0.016	-0.127	0.037	0.633 *	0.446
	(0.495)	*(0.266)*	*(0.255)*	*(0.250)*	*(0.290)*	*(0.382)*	*(0.383)*
Working status	0.569	0.441	0.186	0.005	2.487 ***	0.106	-0.314
	(0.652)	*(0.337)*	*(0.333)*	*(0.326)*	*(0.467)*	*(0.489)*	*(0.508)*
Household size	1.313 ***	-0.247	0.121	-0.195	-0.110	-0.202	-0.042
	(0.340)	*(0.174)*	*(0.172)*	*(0.169)*	*(0.198)*	*(0.266)*	*(0.270)*
Smoking status	0.209	-0.141	-0.585 *	0.277	-0.348	-1.148 **	-0.877 *
	(0.668)	*(0.352)*	*(0.347)*	*(0.338)*	*(0.410)*	*(0.523)*	*(0.532)*
Health status	3.749 ***	-0.534 **	0.374 *	-1.194 ***	0.068	0.257	0.227
	(0.425)	*(0.226)*	*(0.223)*	*(0.236)*	*(0.255)*	*(0.350)*	*(0.364)*
Fitness activity	1.690 ***	-0.006	-0.220	-0.259	-0.150	-0.535	-0.788
	(0.660)	*(0.348)*	*(0.341)*	*(0.334)*	*(0.393)*	*(0.546)*	*(0.586)*
Observation	150	136	136	136	136.000	87	85
Chi-Square	0.53	51.68 ***	9.96	36.25 ***	45.94 ***	232.00 ***	158.68
Nagelkerke		0.33	0.08	0.24	0.33	0.18	0.18

Source: own survey

The results for the north suggest the following aspects (tab. 5):

- the possibility to be overweight or obese is highest among the older age group, male and those with a negative perception of health status;
- the level of nutritional knowledge and information stock is highest among people with high level of education;
- the quality of diet is better among consumers with good perception of health status;
- consumers with a high level of education are the most stressed;
- females are the consumers with the most day flexibility.

Tab. 5 - The role of individual characteristics and situational and attitudinal factors for the northern consumers

	BMI	Nutritional Knowledge	Information Stock	Quality diet	Stress	Flexitime	Flexiday
Age	0.738 **	-0.073	0.234	0.077	0.076	-0.071	-0.033
	(0.342)	*(0.150)*	*(0.145)*	*(0.140)*	*(0.162)*	*(0.151)*	*(0.160)*
Gender	-1.783 **	0.094	-0.001	0.043	-0.493	0.370	0.939 **
	(0.791)	*(0.351)*	*(0.339)*	*(0.330)*	*(0.371)*	*(0.365)*	*(0.407)*
Education	0.279	0.557 **	0.391 *	-0.228	0.514 **	0.103	0.242
	(0.511)	*(0.231)*	*(0.221)*	*(0.214)*	*(0.254)*	*(0.238)*	*(0.259)*
Income	-0.400	-0.043	0.042	0.055	0.244	-0.203	-0.149
	(0.470)	*(0.205)*	*(0.199)*	*(0.193)*	*(0.223)*	*(0.211)*	*(0.223)*
Working status	0.924	-0.438	0.121	-0.416	2.013 ***	-0.599	0.137
	(1.040)	*(0.464)*	*(0.444)*	*(0.433)*	*(0.556)*	*(0.464)*	*(0.502)*
Household size	0.398	-0.066	-0.164	0.170	-0.136	-0.078	-0.079
	(0.342)	*(0.152)*	*(0.148)*	*(0.144)*	*(0.163)*	*(0.153)*	*(0.162)*
Smoking status	-0.754	-0.264	-0.537	-0.274	-0.294	-0.053	-0.144
	(0.820)	*(0.362)*	*(0.353)*	*(0.342)*	*(0.390)*	*(0.366)*	*(0.395)*
Health status	2.529 ***	-0.315	-0.385	-0.499 *	0.415	0.031	-0.003
	(0.636)	*(0.281)*	*(0.274)*	*(0.267)*	*(0.302)*	*(0.282)*	*(0.300)*
Fitness activity	0.558	-0.545	0.142	-0.128	0.352	-0.712 *	0.059
	(0.802)	*(0.355)*	*(0.344)*	*(0.333)*	*(0.410)*	*(0.370)*	*(0.383)*
Observation	150	134	134	134	134	129	129
Chi-Square	0.21	13.34	13.47	9.77	39.13 ***	11.89	8.43
Nagelkerke		0.11	0.10	0.07	0.29	0.10	0.08

Source: own survey

5. Concluding remarks

This study identifies key variables that can affect the time allocated to the search for information and the demographic characteristics associated with these variables. As usual, one must remain aware that the direction of causality is impossible to confirm in cross-sectional studies; however all the employed variables have a theoretical basis for their direct influence. The survey was aimed at analysing the Italian situation related to the importance of information in the process of allocation of free time applying OLS and Ordinal Regression Model for the empirical estimation.

In line with national statistical data, the analysis revealed a different distribution between Apulia and Lombardy in terms of BMI. In fact, the southern region has higher obesity rates.

The survey showed the important role that consumers attribute to information on food in the process of allocation of free time.

The study, for the south sample, showed a relationship between work flexibility, information stock and nutritional knowledge and consumer willingness to devote time to information search.

In the case of northern sample, there is a relationship between the time allocated for information search and work flexibility, information stock and BMI.

Thus, the analyses suggest different policy implications.

The empirical evidence suggests that information plays an important role in consumer choice as it helps consumers make decisions about dietary choices. However, time pressure at work affects the time spent in the search for information. Nevertheless, it is possible to promote a type of information that is very clear and short. This would encourage people with limited free time to take advantage of such information and would furthermore, facilitate information availability to consumers with a low education level.

Between information and the adoption of a healthy diet lies the problem of social inequality. Obesity, for example, is higher in southern areas, where, however, adherence to a Mediterranean diet is higher. It is not just a nutritional problem; there is also an economic reason: in fact the poorest households are those with more pronounced obesity rates.
High calories foods are available at lower prices than most healthy foods such as fruit and vegetables. Therefore, people tend to choose unhealthy food products at lower prices, rather than spend more on healthy foodstuffs. It could be a good practice to promote a reduction in the price of foods good for health to improve their availability to everybody.
Indeed, people of lower income, that constitute the weaker part of society, are more susceptible to tax incentives and tend to change their habits more easily; therefore, price incentive could benefit them in terms of health, reducing overweight and obesity risks through the adoption of a better diet.

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