Ethnographic Study: Finger Food Systems, Contribution to a Project Program in Food Design

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Abstract
This study consists of an ethnographic survey of 50 forms of finger food found by the author on the four continents of America, Europe, Africa and Asia, involving around 20 countries, presented under four morphological typologies wrapped, agglutinated, laminated and contained – and five construction systems – plate, oven, steam, water and bain-marie. The raw materials used in the collection are cereals (68%), pulses (16%), tubers (10%) and seaweed/leaves (6%). The literature review identifies exceptional qualities of combining whole grains with pulses as a dietary contribution to reducing obesity and improving public health. The results of this research will contribute to the author's PhD thesis: design of plant-based mobile finger food, mitigating the hegemony of wheat.

Keywords
Food design
Edible container
Finger food forms
Mobile food systems
(Re)qualification of public health

Introduction

What alternative products, from wheat containers to mobile food, exist in the world's cultures?

The aim of this research is to map and analyze world finger food systems, together with the systematization of the global food public health panorama, supporting the development of a Ph.D. research project in food design: the redesign and construction of a self-edible, plant-based food product for fly-food consumption.

This study will analyze the different ingredients and cooking methods that give rise to multiple constructive, organoleptic, and functional characteristics. In addition, the investigation aims to find healthier food alternatives in other non-European cultures to counteract the products manufactured with wheat flour-based pastes and under frying.

Methodology

Based on the scientific area of design, there is an articulation of technological, sociological, and cultural dimensions which, due to their complexity, were considered in the research design system model (Daymon & Holloway, 2011), encompassing complementary methodological approaches. Thus, we started from the analysis and review of the literature on the state of the art of nutrition and public health from the perspective of the Global Burden of Disease (Afshin et al., 2019), the National Institute of Statistics (Instituto Nacional de Estatística, 2021), the Childhood Obesity Surveillance Initiative: COSI Portugal (Rito et al., 2021), and the National Programme for the Promotion of Healthy Eating, Ministry of Health of Portugal (Gregório et al., 2019).

By observing and comparing globally diverse case studies of traditional and contemporary mobile food systems, we build a critical taxonomy under the ethnographic observation of mobile food design, constituting support for the project statement of food design. The methodology attempts to answer the "How?" as the "What?" and the "What for?" are responded to as we depart from finger food for an increment of public health.

The exercise included the comparative observation of different systems and materials (50 case studies) with a view to the pertinence of a new statement capable of designing new food products.

From the latest systematic analysis of Global Burden of Disease data, operating in 195 countries between 1990-2017, dietary risks from poor nutritional habits are responsible for 11 million adult deaths. Cardiovascular diseases were the leading cause of death, affecting 10 million (9 out of 10 deaths), followed by neoplasia, 20 million (17 out of 24 deaths), and type 2 diabetes, 24 million people (16 out of 33). 177 million deaths per year are due to poor dietary habits, leading to a 2/3 (67%) reduction in average life expectancy (the 5th most contributory risk factor), occurring in adults under the age of 70 (Afshin et al., 2019).

We thus infer that small daily eating habits significantly impact human health.

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A deficient diet will originate consequences such as diseases of the circulatory system (45% of the total), diabetes and kidney diseases (1,6% of the total), neoplasms (1,2% of the total), high plasma glucose, hypertension, high body mass index, alcohol consumption and high LDL cholesterol (Gregório et al., 2019, p. 15) constituting an alarming public health panorama.

It is observed that the factors of anticipation of human death, associated with poor consumption habits characterized by excess sodium and lack of whole grains and fruit, in the order of 50% of total deaths per year, exceed the value of deaths from smoking, 15% (Ritchie, Hannah Roser, 2013). But, assessing average life expectancy, it is also observed that the impact of poor diet is higher, reducing it by about 66% (Afshin et al., 2019).

Portugal was part of this study, integrating the 195 countries under analysis. As a result, in the results of the National Health Survey (2019), the high prevalence of obesity, as the leading risk factor, is observed.

More than half of the portuguese population (53,6%) aged 18 years, or more were overweight or obese in 2019. However, comparing these with the data from 2014 identifies an evolution of more than 0.8% (Instituto Nacional de Estatística, 2021, p. 24).

The reality in the infant class, according to the National Programme for the Promotion of Healthy Eating (Gregório et al., 2019, p. 13), is that approximately 41,6% of Portuguese children between 6 and 8 years old are already overweight or obese (a disorder that prevails mostly in boys), with a tendency to increase with age.

Since Portugal joined a network of European countries for child nutritional surveillance and education, in 2007, in the Childhood Obesity Surveillance Initiative (COSI/WHO Europe) program, the evolution of overweight and obesity in children has been negative. However, over the different years of study (2007 to 2019), there was a 22% reduction in the prevalence of overweight (reduction from 37,9% to 29,6%), as well as obesity (15,3% to 12,0%) (Rito et al., 2021), confirming that these monitoring systems have had highly positive consequences in promoting and changing health standards among the younger age classes.

In the last four decades, because of the growing increase in obesity worldwide, the precipitation of sentences demonizing the consumption of wheat - preceded by fat and added sugar - was generated, suspecting an addictive behavior. However, according to Brouns (2013) the attribution of the cause of obesity to a specific type of food or food component is incorrect since the consequence derives from excessive energy consumption combined with lifestyle inactivity. Nevertheless, researchers from Adelaide University (Australia) and Zurich University (Switzerland) observe a prevalence relationship between the total availability of cereals, rice, and corn and the emergence of obesity (You & Henneberg, 2016).

Rebello (2014), a researcher at the University of Louisiana, proves that the dietary association of whole grains with legumes is a factor in preventing and reducing obesity and, consequently, the diseases associated with it.

“Whole grains and pulses are an abundant source of macronutrients, micronutrients, and phytonutrients that contribute to their health benefits. These food groups differ in their structural and physico-chemical properties and have varying amounts of fiber, resistant starch, vitamins, minerals, and other bioactive components. However, they complement each other. Thus, traditional foods such as the combinations of red beans and rice [...] provide an improved protein quality compared to the individual foods because of their complementary amino acid profiles.

[...] Pulses contain substantial amounts of the B-vitamins and minerals important for human health, such as iron, calcium, and potassium, as well as phytochemicals: bioactive compounds, including enzyme inhibitors, lectins, oligosaccharides, and phenolic compounds.” (Rebello et al., 2014, p. 7029; 7032)

The author brought to discussion an essential contribution of the botanical group of legumes to food, namely the species of chickpeas, lentils, beans, peas, and lupins, whose consumption is well reflected in traditional portuguese gastronomy. Despite the low daily per capita consumption (1/4 of the recommended) as verified in the last National Food Survey 2015/2016 (Gregório et al., 2020, p. 45).

The finding of obesity reduction in consumers of whole grain cereal compounds with legumes will constitute a relevant contribution to the development of the author’s ongoing research, with a view to the design of new finger food containers. Furthermore, cereal pastes enriched with pulses acquire a recognized protein, vitamin, and mineral salts value (iron, potassium, and calcium) – approximately 50 to 65% of carbohydrates (starches), 20 to 40% of protein, 10 to 20% of fiber – will constitute a suitable alternative to the pastes traditionally used in Europe based on refined wheat.

Case studies

To answer the research question, we conducted an ethnographic survey of descriptive case studies relating to several globally diverse finger food systems (savory type) from four continents (America, Europe, Africa, and Asia). This observation identifies a set of forms resulting from the binomial raw material x construction system, reflecting specific cultures. Each of the examples presented was characterized by the following topics: territorial origin and respective original product designation, raw materials, typology of forms, and constructive taxonomy.

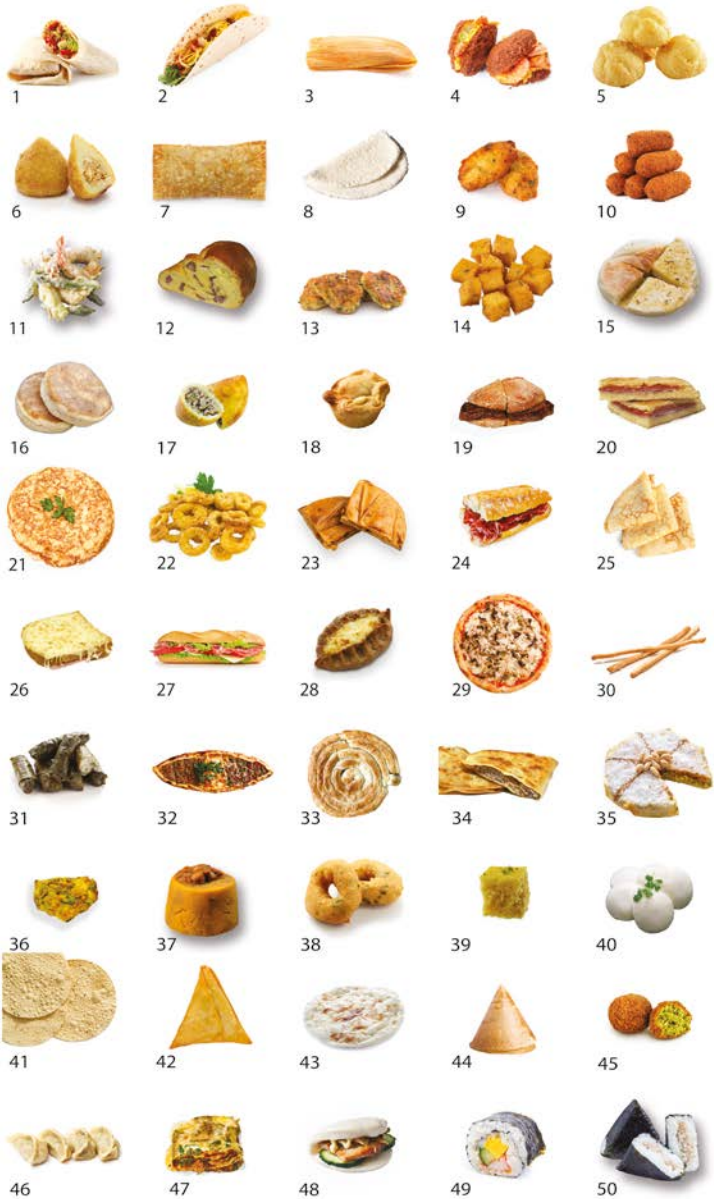

Fig. 1
Ethnographic survey of hand-eating systems. Authorship: Lígia Afreixo. Credits: Istock, Deposit-photos.

	AGGLUTINATE	CONTAINER	LAMINATE	WRAPPED
MEXICO	**Tamale** - Maize flour paste steamed and wrapped in a non edible casing (maize, cassava or banana leaves), containing different fillings			**Burrito** - Disk of compressed corn dough fried cylindrically rolling up different fillings **Taco** - Compressed dough disk of corn flour, fried in the shape of a shell, allowing the rolling out of a great variety of fillings
BRAZIL	**Acarajé** - Fried bean and onion paste ball under a frying **Pão de queijo** - Balls of cassava flour paste and grated cheese agglutinated with egg, baked in an oven	**Cocinha** - Elongated ball of chicken coated in wheat paste, subject to frying **Pastel** - Envelope-shaped pastries stuffed with fried meat		**Tapioca crepe** - Pulp based on cassava starch polymerized on the plate, allowing for different fillings
PORTUGAL	**Codfish dumpling** - Long ball of shredded codfish paste with potato, glued with egg and fried **Croquette** - Cylindor of stewed and minced meat paste, agglutinated with egg yolk and wheat flour, coated with breadcrumbs and subjected to frying **Folar** (Trás-os-Montes) - Wheat paste, enriched with egg and animal fat involving salted and smoked pork belly, baked in the oven **Fatanicica** - Seasoned wheat purée surrounding cod fibres, subjected to irregularly shaped frying **Fried corn** (Madeira Island) - Corn paste cooked in water and seasoning, cut into cubes and fried **Bolo do coco** (Madeira Island) - Wheat and sweet potato mixture bread, formed in a high disc and baked in the oven, allowing for different uses and accompaniments **Bolo lêvedo** (Azores Island) - Sweetened wheat bread with milk and eggs, formed in a high disc and baked in the oven, allowing different uses and accompaniments	**Rissol** - Cooked wheat flour disc folded in a half-moon shape, filled with meat, fish or vegetables and subjected to frying **Pies** - Individual containers with lids made of wheat flour pastry stuffed with meat, seafood or vegetables, baked in an oven	**Prego no pão** - Wheat flour ball, baked, laminated in two halves and stuffed with fried or roasted meat **Bifa de carne** - Wheat dough laminate enriched with egg, with slices of smoked meat, baked in the oven, served in portions	**Tempura** - Slices of vegetables or prawns wrapped in a thin batter of wheat flour, coriandarch and egg subjected to frying
SPAIN	**Tortilla** - Egg and potato agglutinated and subjected to slow frying	**Empanada** - Flour pastry balls stuffed with meat, vegetables, tuna or codfish, baked in the oven	**Bocadillo** - Various regional food products (ham, cheese or canned fish) on a wheat bread base, sometimes with mayonnaise glue	**Calamari** - Squid sections in rings surrounded by wheat and corn flour batter, subjected to frying
FRANCE			**Croque monsieur** - Rolled wheat bread stuffed with cheese and ham, pressed and covered with béchamel cheese paste for au gratin **Baguette** - Variety of french bread with an elongated shape that allows it to be laminated and filled with cheese, smoked products or vegetables, sometimes agglutinated with mayonnaise and segmented into stretches	**Crepe** - Flour disk and egg cooked on the grill, folded and rolled up like an envelope with various fillings
FINLAND		**Karélia's Pastel** - Rye flour and curdled milk boat-shaped pastry with rice or mashed potato filling, baked in an oven		
ITALY	**Grissini** - Biscuit baked in the oven, made of wheat flour dough, which can be used to accompany pastes or pâtés			**Pizza** - Flour disc with various laminated ingredients, mixed with tomato paste and cheese, baked in the oven
GREECE TURKEY IRAN				**Dolmade** - Vine leaf enveloping various fillings (notably minced meat with rice), steamed
TURKEY		**Pide** -Pastry made of wheat flour, in the shape of a boat, with a filling of minced meat, baked in an oven **Börek** - Rolling of meat or vegetables through filo pastry (wheat flour), baked and cut into pieces		
AZERBEIJAN		**Qutab** - thin disc of wheat paste cooked on a grill and folded in half-moons, filled with cheese, herbs and sometimes pine nuts		

	AGGLUTINATE	CONTAINER	LAMINATE	WRAPPED
MAGHREB MOROCCO		**Pastilla** - Puff pastry disk with a sweetened minced meat filling, baked in the oven		
MOZAMBIQUE INDIA	**Bedji** - Bean flour or chickpea flour cooked with other seasonings and agglomerated in balls under frying			
NIGERIA	**Moin Moin** - Bean paste pudding with fish and boiled egg, wrapped in banana leaf and cooked in a bain-marie			
INDIA	**Vada** - Seasoned mung bean paste, formed into rings and fried		**Papadam** - Thin lentil flour disc, fried and crunchy, which encourages the ingestion of sweet and spicy pastes or sauces	**Dosa** - A thin disc of lentil paste and cooked rice surrounding sweet and sour fillings and jams
	Dhokla - Chickpea noodles, steamed on tray, cut into cubes **Idli** - Steamed lentil or rice balls **Samosa** - Triangle of wheat flour pastry with different vegetarian or meat fillings, submitted to frying **Naan bread** - Bread made from wheat flour paste and yoghurt, baked in the walls of a clay oven			
MIDDLE EAST	**Falafel** - Fried chickpea or fava bean paste dumpling			
CHINA		**Gyoza** - Half-moon of thin dough made of wheat flour and corn starch, stuffed with minced meat or vegetables, steamed or fried		**Jianbing** - Wheat flour and mung bean flour laminate, with egg interspersed with a vegetable, herb and minced meat filling, cooked on the grill and folded into an envelope shape **Rou Jiao** - A high disc of steamed wheat flour and milk dough folded to wrap a slice of meat cluster
JAPAN				**Sushi** - Fish wrapped in rice paste cooked in cylindrical forms wrapped in nori seaweed and cut into small portions **Onigiri** - Triangle of rice paste with fish filling, fully lined with nori seaweed

GRAIN (CORN) · GRAIN (WHEAT) · GRAIN (RYE) · GRAIN (RICE) · PULSES (BEAN) · PULSES (CHICKPEA) · PULSES (LENTIL) · PULSES (FAVA) · TUBERS (CASSAVA) · TUBERS (POTATO) · VINE LEAF · SEAWEED

Tab. I
Ethnographic survey of food systems for eating by hand: product name, territorial origin, shape typology, raw material and constructive taxonomy (agglutinated, container, laminated, and wrapped). Authorship: Lígia Afreixo.

The selection of the 50 case studies presented results from knowledge acquired through travels, documentaries, reviews of specialty literature, and research on online platforms.

From the comparative analysis of the data in the table above, we found that half of the observed models are wheat-baked products and that in the whole set of cases, 2/3 (68%) use cereals (50% wheat, 14% corn, 2% rice and 2% rye). The remaining 1/3 (32%) is made up of 16% legumes (beans, chickpeas, and lentils), 10% tubers (potatoes and cassava), and others (6% vine leaves and Noori seaweed).

Despite the reduced number of typologies considered – agglutinated, container, laminated, and wrapped –, the 50 cases studied are differentiated by an infinite number of flavors and different implementations, extending the organoleptic domain of the form, a manifestation of an enormous human creative potential of adaptation to each geography and culture.

Regarding constructive characteristics, we studied the method of making and combining the basic raw materials that allow us to obtain a specific type of shape.

Throughout our research, we realized that specific food model that today partially or totally integrate wheat were in the past produced from other raw materials such as legumes (chickpeas or lentils). In China, fast food products predominantly made from rice are now being replaced by wheat. This food shift towards an international hegemony of wheat is justified by the economic accessibility of a product massively cultivated by China, India, Russia, the United States, and France, which produce about 52% of the wheat made worldwide. When today, and in the portuguese market, we compare the price of wheat flour with other cereal flours and with dried pulses; we see that chickpeas cost 1,4 times as much as wheat flour, lentils twice as much, dried beans and corn and rice flour more than twice as much. With the necessary corrections of scale, the cost of wheat is recognized as favorable to the hegemony of its consumption by westernizing eating habits in today's globalized world.

Despite the low economic relevance of legumes and other plant foods (such as tubers, leaves, and seaweed), there are nutritional qualities of proteins (collagen), vitamins, minerals, and starches that may offset the cost difference. However, the main advantage will be combining whole grains with legumes, according to Rebello (2014), which is associated with a proven weight rebalancing factor, reversing the accumulation of visceral fat and the whole set of pathologies associated with it.

Through the ethnographic comparison of cases by similarity or difference, it was possible to understand and systematize the different morphological families to which each product belongs. Thus, we identified four significant typologies: containers chemically transformed by steaming, grilling, baking, or frying, confining fillings, and originating products such as rissoles, pies, *empanadas*, *gyoza*, *samosa*, and meat pasties. The laminated products consist of products that are layered in parallel layers. Food pastes can physically aggregate this typology. We find sandwiches and certain types of puff pastry, *croque monsieur*, and *Prego no pão* (Beefsteak sandwich). The case of wrapped products consists of wrapping materials with other elements such as cabbage or vine leaves, seaweed, corn or wheat disks cooked on a plate: the dolmade, the taco, or the sushi.

Finally, the agglutinates, pastes, or elements aggregated by chemical means, are subjected to frying or baking, such as croquettes, *tortillas*, codfish dumpling, falafel, or *moin moin*.

The consideration of this collection of shapes and constructive systems may contribute to the design of new food solutions, which we intend to develop in the scope of the ongoing Ph.D. thesis project, testing new material combinations by reducing the percentage of de-husked wheat and introducing whole wheat, combined with tubers, pulses, vegetables or fruit. The result to be prototyped will also be characterized by organoleptic and communicational aspects, assigning chromatic and morphological codes to the different fillings, exploring both the nutritional modularity of the products and the playfulness of their consumption.

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References

Afshin, A., Sur, P. J., Fay, K. A., Cornaby, L., Ferrara, G., Salama, J. S., Mullany, E. C., Abate, K. H., Abbafati, C., Abebe, Z., Afarideh, M., Aggarwal, A., Agrawal, S., Akinyemiju, T., Alahdab, F., Bacha, U., Bachman, V. F., Badali, H., Badawi, A., … Murray, C. J. L. (2019). Health effects of dietary risks in 195 countries, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *393*(10184), 1958–1972. https://doi.org/10.1016/S0140-6736(19)30041-8

Brouns, F. J. P. H., Van Buul, V. J., & Shewry, P. R. (2013). Does wheat make us fat and sick? *Journal of Cereal Science*, *58*(2), 209–215. https://doi.org/10.1016/j.jcs.2013.06.002

Daymon, C., & Holloway, I. (2011). *Qualitative Research Methods in Public Relations and Marketing Communications*. Routledge Taylor & Francisc Group.

Gregório, M. J., Guedes, L., & Sousa, S. M. (2019). *Programa Nacional para a Promoção da Alimentação Saudável*. Ministério da Saúde | Direcção Geral da Saúde.

Gregório, M. J., Sousa, S. M., & Teixeira, D. (2020). *Programa Nacional para a Promoção da Alimentação Saudável 2020* (p. 45). Direcção Geral da Saúde.

Instituto Nacional de Estatística. (2021). *Anuário Estatístico Portugal 2020* (p. 24). Instituto Nacional de Estatística, IP.

Rebello, C. J., Greenway, F. L., & Finley, J. W. (2014). Whole Grains and Pulses: A comparison of the Nutritional and Health Benefits. *Journal of Agricultural and Food Chemistry*, *62*, 7029–7049. https://doi.org/dx.doi.org/10.1021/jf500932z

Ritchie, Hannah Roser, M. (2013). *Smoking*. Institute for Health Metrics and Evaluation. https://ourworldindata.org/smoking

Rito, A., Mendes, S., Baleia, J., Grefgório, M. J., & Graça, P. (2021). *Childhood Obesity Surveillance Initiative—COSI Portugal 2019*. Instituto Nacional de Saúde Doutor Ricardo Jorge, IP.

You, W., & Henneberg, M. (2016). Cereal Crops Are not Created Equal: Wheat Consumption Associated with Obesity Prevalence Globally and Regionally. *AIMS Public Health*, *3*(2), 313–328. https://doi.org/10.3934/publichealth.2016.2.313