Food Policy 69 (2017) 176–189

Contents lists available at ScienceDirect

Food Policy

journal homepage: www.elsevier.com/locate/foodpol

A consumer-oriented model for analysing the suitability of food classification systems

Carla Marano-Marcolini *, Francisco J. Torres-Ruiz

University of Jaén, Department of Business Administration, Marketing and Sociology, Campus Las Lagunillas s/n, 23071 Jaén, Spain

ARTICLE INFO

Article history:
Received 21 January 2016
Received in revised form 9 March 2017
Accepted 1 April 2017
Available online 11 April 2017

Keywords:
Food classification
Food categorization
Consumer learning
Consumer orientation

ABSTRACT

The main function of food classification systems is to regulate the market and inform it (consumers above all) about the different types of products and their characteristics. However, the reality is that many of these systems give rise to confusion and prevent consumers from obtaining a clear idea of them, making the purchasing process more difficult. The objective of this study was to propose a method that can be used as a basis or reference framework for analysing the suitability of any food classification system, based on maximising consumer comprehension and learning, before introducing it into the market. The model proposed establishes the procedure and the necessary indicators for identifying the advantages and drawbacks of each of the different systems, making it possible to compare their suitability. The model was tested empirically by comparing the current classification of orange juices and Iberian ham with two different proposals, in an experiment conducted with an online consumer panel, and using MANCOVA to analyse the differences between the six indicators related to consumer learning results. It was concluded that the model is suitable for assessing the suitability of the classification systems, as it shows technical viability, ease of introduction in practically any situation and the ability to facilitate and guide the process of drawing up consumer-oriented food classification systems.

1. Introduction: the food classification problem

To help consumers to choose among the wide range of different foods available on the market and regulate their marketing, a number of food classification systems (FCS) have been drawn up. They are composed of a set of categories accompanied by descriptions that provide information on their respective characteristics. However, the reality is that in many cases consumers are incapable of making suitable choices and display a low level of product knowledge. This problem can be attributed not only to changes in FCSs, but also to the deficiencies or limitations of the systems themselves. Rather than helping or facilitating the process of choosing and buying, problems such as the use of similar terms, ambiguous descriptions of the products included in each category or confusing or excessively technical descriptors included in labels can sometimes confuse consumers and lead to erroneous beliefs (Aydinoglu and Krishna, 2011; Dörnyei and Gyulavári, 2015; Dunbar, 2010; Garg et al., 2007; Grunert et al., 2010; Grunert and Wills, 2007; Hall and Osses, 2013; Mackey and Metz, 2009; Mackison et al., 2008; Malam et al., 2009; Nocella and Kennedy, 2012; Sharf et al., 2012).

The term FCS has been employed in the literature to indicate the empirical manner in which consumers classify food products in their day-to-day lives (snacks full meals, homemade or precooked food, consumption occasion, etc.) or proposals or documents of a technical nature relating to nutrition, marketing and international harmonisation (for further details see part 2). Food classifications are relevant with regard to organisation and communicating information within different areas of food science, such as nutrition, marketing, unit operations and microbiology (Costa et al., 2001). In our context we consider FCSs to be restricted to official food classifications, of compulsory establishment on the Market in order to provide information to consumers and to all the elements of the agrifood chain, homogenising and harmonising production and marketing, varieties and/or qualities. They are usually designed with technical committees proposals, which consults experts or members of the sectors affected.[1] As a consequence, there can occurs a gap between the theoretical objective of the sys-

* Corresponding author.
E-mail address: cmarano@ujaen.es (C. Marano-Marcolini).

http://dx.doi.org/10.1016/j.foodpol.2017.04.004
0306-9192/

[1] In the European scope, the European Commission drafts reports modifying or changing classifications which may finally be discarded when the final Regulations are approved (for an example of the case of olive oils, see: on the proposal for a Council regulation amending Regulations No 136/66/EEC and (EC) No 1638/98 as regards the extension of the period of validity of the aid scheme and the quality strategy for olive oil (COM(2000) 855 – C5-0026/2001 – 2000/0358(CNS))).

tem (to inform, clarify, help with the choice, eliminate confusion, enhance nutrition, etc.) and how these classifications are really interpreted by the consumers.

In essence, in the present study, an FCS is made up of two parts: a set of terms (categories) and descriptions of each category (information). Naturally, since the aim is to produce a guide for consumer orientation and clarification and the categories and descriptions are necessarily limited in length, the choice of terms and wording is crucial. The choice of one word or another can influence the marketing of the product and the structure of the market for years, and can make consumer learning much more easy or difficult. In the same way, it can favour certain categories or levels of quality over others. Finally, the connotations of words must not be forgotten, as they have a heuristic potential for generating possibly false beliefs in the mind of the consumer (Smith et al., 2013, 2014).

Despite the negative repercussions that a poor categorisation system can have (a clear example is given in Section 1.1), the bibliography does not mention any model that can serve as a guide to assessing the suitability of a system, leading to inefficiencies in system design processes and serious problems on the market.

The fundamental objective of this research is to develop a model or method for analysing the suitability of an FCS from the point of view of its main function when used in a food education context: to inform and help consumers in making choices. The starting point, therefore, is that the suitability of any system proposed depends on its usefulness to consumers in deciding purchases and on how easy it is to learn and how easily and effortlessly it differentiates between the different products and their characteristics.

1.1. A typical case of the problems caused by a poor classification system: olive oils

A prime example of how poor categorisation can cause confusion among consumers and influence product marketing for many years is what has happened with olive oils in Spain. The current classification of olive oils is the result of a series of EU regulations that have successively tried to remedy the deficiencies of some agents detected in previous classifications. Table 1 summarises the current classification of olive oils and the problems it has been found to cause.

All these problems that spring from the quality of the official classification may have effects on consumer learning and confusion. In the case of Spain, for instance, the top world olive oil producer and a country where this is one of the most emblematic products in the diet, over 60% of consumers think that "olive oil is pure olive juice, without manipulation"(related to problem 2), only 30% know that "olive oil is a mixture of virgin and refined olive oils" (related to problem 2 and 6) and over 70% think that "the main factor in differentiating between qualities is the acidity" (Torres-Ruiz et al., 2015). This could explain that the most consumed oil in Spain is olive oil (not virgin), in spite of its lower quality and healthiness[2] and even though the difference in price is barely € 0.3/litre according to the Ministry of Agriculture, Food and Environment food consumption panel data (2015). Furthermore, many producers find it difficult to sell quality oils. In short, the official classification system is no incentive to quality, production levels or consumption, in opposition to the guidelines of the Common Agricultural Policy and the efforts of the Spanish Government.

However, olive oil is not an isolated case. The problem of using terms that are both attractive and similar for clearly different products, hindering consumer learning and choice, is also found to persist in other cases such as the Spanish cases of fruit juices (Royal Decree 781/2013) (fruit juices, fruit juices from concentrate, concentrated fruit juices, dehydrated or powdered fruit juices and fruit nectar) and Iberian ham (100% Iberian acorn-fed ham, Iberian acorn-fed ham, Iberian pastured, fodder-fed ham ('de cebo de campo') and Iberian fodder-fed ham ('de cebo')). Furthermore, this classification of hams in Spain is the result of a recent change in the nomenclature, as the former designations were understood to cause confusion and misunderstandings (Royal Decree 4/2014). Both classifications are analysed empirically in this work.

The problem is important and shows the need for a model or method that will allow *a priori* assessment of the effectiveness of a classification system based on objective indicators.

2. Types of food classification systems from the point of view of consumer participation in the design

Many groups of people are interested in food categorisation systems (dieticians, teachers, cooks, retailers, producers, government agencies, etc.) and in their international harmonisation or coordination, which is necessary to facilitate trade between countries. As a result, attention has been paid to these systems, although frequently from a different perspective from that of the present research (usefulness to consumers from the perspective of marketing and food policy). From the point of view of consumer participation or consultation, the bibliography containing the referenced term can be divided into two groups.

2.1. Technical or technological classification systems

Systems based on technical aspects of foods, such as their characteristics and nutritional description, generally aim to be general reference works covering all foods. Their basic usefulness is as references for researchers, government agencies and international trade. The most common technical classification systems are based on nutrition and diet (Costa et al., 2001). Typical examples are the fruit and vegetable system devised by Pennington and Fisher (2009), or that of Lennernäs and Andersson (1999), based on eating episodes (Food-Based Classification of Eating Episodes-FBCE).

Computerised systems which classify foods into universal categories or enter foods and their descriptions into large databases (Ireland and Møller, 2000) can be included among the technical or technological classification systems. Classifications are based on different criteria, such as type (vegetable, cereal, etc.) or use (drink, main meal, etc.). In turn, the categories can be divided into subcategories with more precise descriptions. Some International databases can be included in this group. One of these is *Eurocode 2*, a European system based on alphanumerical codes, which highlights food products' features of interest for people conducting surveys (Leclercq et al., 2001). Another important system involves *Langual,* a multilingual facetted thesaurus created to describe foods in a systematic manner, and whose main objective is to develop a common classification system in Europe (Ireland and Møller, 2010). Recently, it has been developed the food classification and description system FoodEx2 by the European Food Safety Authority (2015). This is a FCS with a great capacity to collect descriptive elements and organise the group of foods hierarchically.

In general, these systems are not intended for end consumers. They also present some problems, such as that the same product can be classified into two or more groups, that the generic descriptions of the foods can sometimes be very vague and give little detail, or that because of differences in legislation, economic importance and culture, they vary in each country (Ireland and Møller, 2000). As Costa et al. (2001) pointed out, they are incapable

[2] At least when it is consumed at low temperature (considering its antioxidant content), since when it is subjected to high temperatures there is no consensus in the literature (Santos et al., 2013).