

Using photographs in consumer research of agricultural and livestock products

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SUMMARY

Photographs provide momentary visual data that facilitate consumer understanding, thus visual research methods have been used to obtain their perceptions and experiences. We aimed to conduct a literature review using studies related to the theme of this paper, to obtain an overview of sustainability, animal welfare, consumer behaviour, and the use of photographs in animal science research. The analysis method considered was qualitative and the information was obtained from scientific articles from Google Scholar, Scientific Electronic Library Online (SciELO) and Elsevier research platform databases, published in the last seven years, as well as from classical bibliographies to carry out a bibliographic survey related to the theme of the study. It was concluded that during the meat buying process, consumers' choices are determined mainly by the lowest price, origin, brand, product information, color, marbling, amount of fat, texture, freshness, type of cut and product conservation. The consumption of products from sustainable production and with animal welfare is still very low, mainly due to socioeconomic issues and lack of knowledge about the production process of animal products. The adoption of photographs in consumer research is capable of increasing the information load with reduced cognitive effort, reducing uncertainties during decision making. There is still a scarcity of works with photographs related to animal science and the increase would be opportune to avoid possible misinterpretations by consumers during the survey questionnaires.

KEY WORDS: Food choices. Images. Preference.

1 INTRODUCTION

Concomitant to the intensification of animal production systems (FRASER, 2008a), questions are generated in consumers, mainly due to environmental impacts, sustainability (VAN ZANTEN; VAN ITTERSUM; DE BOER, 2019) and the possible neglect of animal welfare (YUNES; VON KEYSERLINGK; HÖTZEL, 2017) according to the five freedoms, very widespread worldwide, on the quality of life of production animals (MELLOR; BEAUSOLEIL, 2015; MELLOR, 2016).

Consumers have been showing more interest about the processes of how animal production occurs (PEJMAN et al., 2019) and are influential in the market (VON KEYSERLINGK; HÖTZEL, 2015), despite the multiple and different animal welfare concepts generated by consumers (ALONSO; GONZÁLEZ-MONTAÑA; LOMILLOS, 2020). Understanding their demands, needs, expectations, motivations, and perceptions are important, since they are the last step in the food production chain (AVILES et al., 2020).

Visual research methods have been used in several areas, such as in advertising/marketing and consumer behaviour research (SCHROEDER, 2003) and are able to provide greater understanding of the meanings of the built environment to stimulate the imagination of research participants (PETERMANS; KENT; VAN CLEEMPOEL, 2014), obtaining their perceptions and demands (BURT; JOHANSSON; THELANDER, 2007).

Visual information such as photographs, are able to increase imagination (ADAVAL; SALUJA; JIANG, 2019), providing a more vivid mental simulation (KIM; CHOI; WAKSLAK, 2019; SEPTIANTO; KEMPER; PARAMITA, 2019), causing it to be processed faster and without as much mental effort (KIM et al., 2021), decreasing uncertainty during decision-making (ZINKO et al., 2020), and improving the understanding of information.

It is necessary to obtain information about the perception of consumers of animal products through photographs for the proposition of possible interventions and market strategies, since there is a shortage of scientific/technical studies using them in the area of animal science with the use of images.

2 OBJECTIVE

In view of the above, the objective of this work was to conduct a literature review to obtain an overview of sustainability, animal welfare, consumer behaviour, and the use of photographs in animal science research.

3 METHOD OF ANALYSIS

The present study is an exploratory review of qualitative and informative nature. Studies based on qualitative information contribute expressively to the propagation of scientific evidence about the object of study (PEREIRA et al., 2018). The search for the literature review included in this study was conducted by means of an electronic search in the Google Scholar, Scientific Electronic Library Online (SciELO) and Elsevier research platform databases.

As inclusion criteria, we considered bibliographies that dealt with topics related to sustainability, animal welfare, consumer behaviour, and the use of photographs in research related to the area of animal science that were published in the last seven years, namely 2015, 2016, 2017, 2018, 2019, 2020, 2021, and 2022, in addition to classic bibliographies for conducting a bibliographic survey related to the theme proposed in this work.

Exclusion criteria were the bibliographies that did not meet the study's objective and were not within the margin of the period described for conducting the research. For the analysis and interpretation of the results, an analytical reading was carried out with the purpose of organizing and summarizing the information contained in the consulted materials, in such a way as to make it possible to obtain answers to the research objective.

Data collection followed the following premise: a) Exploratory reading of all the selected material (quick reading that had the objective of verifying whether the consulted work was of interest to the study or not); b) Selective reading (more in-depth reading of the parts that were really of interest to the study); c) Registering the information by means of a file (authors, year, method, results, and conclusion).

4 RESULTS

4.1 Sustainability in animal production systems

Brazil has great climatic and ecological diversity (DICK, 2021) and large area of 851.577 million hectares for livestock production (ABIEC, 2021). Livestock plays an important role in the production of forage and other products such as agricultural by-products and crop residues of high nutritional value food crops (MOTTET et al., 2017). Beef productivity in Brazil has increased receding the used pasture areas, in the year 1990 1.60 @ ha-1 year-1 were produced in 191.30 million hectares while in the year 2020 4.20 @ ha-1 year-1 were produced in 165.20 million hectares (ABIEC, 2021).

Despite the increasing animal productivity with decreasing pasture areas, the increased demand for meat products and consequently higher production, generate questions from consumers related to animal production, especially the environmental impacts, production

systems and animal welfare (BROOM; FRASER, 2015; VAN ZANTEN; VAN ITTERSUM; DE BOER, 2019).

Consumers have been showing greater concerns about sustainability issues and how their actions can influence the environment (LIU et al., 2017). They are able to reduce greenhouse gas emissions (POORE; NEMECEK, 2018) and the depletion of natural resources when consuming food from products sourced from a more sustainable production site (HASHEMI et al., 2019). However, sustainability is still little considered by consumers during the process of choosing a food, and when considered, in most cases it is for health reasons (VAN BUSSEL et al., 2022).

The lack of consideration in relation to sustainability can occur by the lack of knowledge of the concept of the term, making it necessary to understand how consumers define it, since their food choices will be responsible for more sustainable diets (VAN BUSSEL et al., 2022). The use of natural resources and greenhouse gas emissions are considered indicators to verify sustainability (JONES et al., 2016), as well as the loss of biodiversity and the area of deforestation. In counterpoint, local, organic, seasonal (VAN BUSSEL et al., 2022) and artisanal foods are considered sustainable by people (ALLÈS et al., 2017), highlighting the need for sustainability information on product labels (APRILE; PUNZO, 2022).

Due to consumers' awareness of production systems, they have been demanding that production processes actually promote animal welfare and reduce environmental contamination, the use of synthetic or chemical products and additives that may be harmful to health and the environment (GARCÍA-TORRES; LÓPEZ-GAJARDO; MESÍAS, 2016). The labels of organic products provide greater security in relation to animal welfare and environmental care to the consumer, factors that provide added value to the products (GARCÍA-TORRES; LÓPEZ-GAJARDO; MESÍAS, 2016). However, the difficulty in changing consumption patterns can be justified by cultural and socioeconomic factors (VAN BUSSEL et al., 2022).

4.2 Animal Welfare

The pleasant and unpleasant emotions and feelings felt by animals were more precisely defined with the technical term called "affective states" and after that, the notions of animal welfare, beyond affective states, came into debate, such as naturalness, basic health and normal functioning (FRASER, 2008b).

The debate around naturalness refers to the ability of animals to perform their natural behaviours and basic health and normal functioning of animals being free of disease, injury, having access to quality water, food and shelter. The overlap of these three conceptions is used in the pursuit and improvement of animal welfare. The diversity of conceptions regarding animal welfare serves to conduct a wide range of research, responsible for clarifying and improving animal welfare (FRASER, 2008b).

Currently, the five freedoms are considered valuable for maintaining the animal welfare standard, thus, animals should be free from hunger, thirst and malnutrition, free from fear and distress, free from physical and thermal discomfort, free from pain, injury and disease, and free to express their normal behaviour patterns (MELLOR; BEAUSOLEIL, 2015; MELLOR, 2016).

The growing demand for animal products has made the intensification of production systems inevitable (YUNES; VON KEYSERLINGK; HÖTZEL, 2017; ALONSO; GONZÁLEZ-MONTAÑA; LOMILLOS, 2020), which allow for increased stocking rates and concomitantly, higher levels of profitability and productivity (MA, BICKNELL, RENWICK, 2020).

Productions based only on the search for efficiency are criticized (BROOM; FRASER, 2015) and there is a growing concern of consumers regarding the possible effects of the intensification of production systems on the welfare parameters of farm animals, even if multiple and different animal welfare concepts still occur to consumers (ALONSO; GONZÁLEZ-MONTAÑA; LOMILLOS, 2020).

The general public has little knowledge related to agricultural and farming practices and production processes (CORNISH; RAUBENHEIMER; MCGREEVY, 2016). However, the opportunity to improve animal production systems is also up to consumers, who, being aware and responsible during the purchase, can collaborate with the implementation of animal welfare and sustainability in the production system (ALONSO; GONZÁLEZ-MONTAÑA; LOMILLOS, 2020).

Consumer perception can influence the development of industry actions and regulations and stimulate a market concerned with animal welfare issues (VON KEYSERLINGK; HÖTZEL, 2015). The European Union currently has regulations related to animal welfare and encourages other countries to follow suit (THORSLUND et al., 2016).

The influence of the public can stimulate strategic marketing actions to increase the sale of products coming from animal welfare productions (DE GRAAF et al., 2016). Therefore, consumers' perceptions and their attitudes related to the topic can lead to decreased acceptance of products with low animal welfare levels, as well as the search for sustainable food systems, which animal welfare falls under (WILLET et al., 2019). Consumers consider products with higher animal welfare levels to be healthier, safer, more acceptable, more environmentally friendly, among others (ALONSO; GONZÁLEZ-MONTAÑA; LOMILLOS, 2020).

In the case of vegetarianism or veganism, consumers are usually influenced by disagreement regarding animal production systems, in addition to other aspects such as sustainability (HAGMANN; SIEGRIST; HARTMANN, 2019). But, there is a lot of wrong or misinformation passed to consumers about how animal production occurs which can lead to a reduction in the consumption of animal products. Every day animal production systems are seeking alternatives to improve the lives of farm animals and the sustainability of the systems, in addition to the quality of the products generated.

Educating and raising awareness of younger generations, providing support to producers and increasing regulations regarding animal welfare can turn concerns regarding about this into a collective goal (ESTÉVEZ-MORENO, 2021) and that to achieve this it is necessary to stimulate and teach or update rural producers on the subject (ALBERNAZ-GONÇALVES; OLMOS; HÖTZEL, 2021).

It is essential to generate an integrative vision between sustainability, animal welfare and human, known as "One-Health" (VALADEZ-NORIEGA et al., 2018). It should be carried out by improving production systems so that there is a reduction in the incidence of diseases, indiscriminate use of antibiotics, etc., resulting in improved human-animal health and welfare (ALONSO; GONZÁLEZ-MONTAÑA; LOMILLOS, 2020).

4.3 Consumer perceptions

Food choices are common daily activities and during these moment consumers are influenced by several underlying reasons such as convenience (ALLÈS et al., 2017), health, taste, and price (GOLDSMITH; FRIEDMAN; DHAR, 2019). These characteristics are still more influential than sustainability, for example (VAN BUSSEL et al., 2022).

Consumer choices may be based on congruent or incongruent actions, depending on the context of this consumer (GOLDSMITH; FRIEDMAN; DHAR, 2019). They may present incongruities between health and taste, such as when healthier foods are thought to be less tasty (JO; LUSK, 2018) or between the health-price relationship where some consumers choose more expensive foods because they believed them to be healthier (BANOVIC et al., 2019).

Consumers' purchasing intentions may differ according to sociodemographic characteristics (CLARK et al., 2016) such as gender, age, education level, income (ESTÉVEZ-MORENO, 2021). During the purchase of animal products, consumers generally evaluate four main aspects, being them, sensory characteristics, wholesomeness, convenience and characteristics of the production process (CLARK et al., 2016; GRUNERT et al., 2020).

The characteristics of the production process refer to the obtaining of the product, including the production system (BROOM, 2018). Information about its production is not available in all products and this characteristic tends to influence consumers in purchase decisions, since consumer preferences are, for example, for products from animals raised cage-free when compared to animals raised in cages (DÌAZ-CARO et al., 2019), as shown in Figures 1 and 2.

Figure 1 - Cage-free hens



Source: The author (2022).

Figure 2 - Cage hens (traditional egg production system)



Source: The author (2022).

The adoption of vegan diets, which there is no consumption of any type of animal products (VEGAN IRELAND, 2018), vegetarian, which one can consume eggs and/or dairy products or flexitarian can be related to these issues (BACKER; HUDEERS, 2015).

Flexitarians, are people who do not exclude meat products, but limit or try to reduce their consumption consciously, but there is still little knowledge about how flexitarians carry out their food choices (ROSENFELD; ROTHGERBER; TOMIYAMA, 2020; NOGUEROL et al., 2021).

Currently, consumers show greater awareness and interest about food production processes and have a determining role in the market (PEJMAN et al., 2019). Public rejection of aspects of production systems may be able to influence the development of regulations and industry actions (VON KEYSERLINGK; HÖTZEL, 2015), since consumers are the last step in the food production chain, so understanding their demands, needs, expectations, motivations and perception are important for the industry (AVILES et al., 2020).

What consumers consider essential must be evaluated to elaborate a successful strategy (THORSLUND et al., 2016) and market research (AVILES et al., 2020), since meeting their demands and expectations are essential elements for satisfaction in a future moment of purchase (PASSETTI et al., 2017). For this to occur in a sustainable way, there must be dialogues between retail and industry with society, since the changes must be in accordance with those who demand (YUNES; VON KEYSERLINGK; HÖTZEL, 2017).

At the current moment, there are concerns related to production forms, such as environmental impact, animal welfare, search for healthier diets, and social and ethical attributes (HAGMANN; SIEGRIST; HARTMANN, 2019; TEIXEIRA; RODRIGUES, 2021). For this to occur, market strategies for increased meat demand must be based on marketing and investments in sustainable production both economically, environmentally and socially and high quality products (PASSETTI et al., 2017), as well as clear communication of sustainability concepts (VAN BUSSEL et al., 2022).

4.4 Parameters used during the purchase of meat

Meat quality is evaluated by consumers in the process of buying and consuming this food (SANTOS et al., 2021). During the meat buying process, consumers base their quality choices on several factors, according to their extrinsic and intrinsic memories (HENCHION; MCCARTHY; RESCONI, 2017).

Extrinsic memories are usually related to price, origin and brand, labels, product information (HENCHION; MCCARTHY; RESCONI, 2017; SANTOS et al., 2021), feeding practices, production systems, and product processing (BOITO et al., 2021). In a survey of consumers in South America, the most important extrinsic characteristics were product origin and information about feeding the animal, followed by age of the animal, hygiene during rearing, and breed of the animal (ARENAS DE MORENO et al., 2020).

Intrinsic memories are related to product characteristics that cannot be changed, such as color, marbling and amount of fat, texture, freshness, type of cut, hygienic-sanitary conditions, preservation, and maturation (HENCHION; MCCARTHY; RESCONI, 2017; SANTOS et al., 2021). Intrinsic memories make consumers choose the product according to their personal qualitative preferences and ethical ideologies (BOITO et al., 2021).

Consumers' perceptions of the type of food or brand are capable of triggering positive or negative emotions about a given product, with memories of positive emotions encouraging the consumer to repeat the product purchase, for example (SCHOUTETEN, 2017). Brazilian consumers, according to a survey, consume beef four or more times a week and their priorities during the purchase are the overall appearance of the product, apparent freshness, color, and ease of preparation. In addition, the places most used for the acquisition of products by consumers are supermarket butcher shops, followed by packaged products that are sold on the shelves (BOITO et al., 2021).

The pre-established perceptions of these consumers regarding meats are that red colored are fresher, tastier, and have better texture than purple and brown colored meats, which are associated with spoiled meats (HENCHION; MCCARTHY; RESCONI, 2017; SINGH; SKUKLA; MISHRA, 2018). Therefore, consumers relate color to the shelf life of meat (PASSETTI et al., 2017). Fat contents are associated with texture, juiciness and flavor (O'QUINN et al, 2012), however, high contents can be avoided due to health concerns (FRANK; JOO; WARNER, 2016).

Price is considered the most important attribute because it is an economic factor (HENCHION; MCCARTHY; RESCONI, 2017), causing limitations and conditioning the purchase due to this (SANTOS et al., 2021). However, consumers with higher purchasing power have been showing more willingness to pay for products labeled ecologically and/or with animal welfare (SONODA et al., 2018). Information about the animal production process, consumers prefer pasture-raised animals to confined ones; however, in sensory tests consumers end up preferring meat from animals that were raised in a confined system over those produced in pasture (GARCÍA-TORRES; LÓPEZ-GAJARDO; MESÍAS, 2016).

4.5 Photo elicitation

Visual information consists of information generated to consumers, capable of increasing their imagination, and can be characterized by graphics and photographs (ADAVAL;

SALUJA; JIANG, 2019). Mental simulation theory demonstrates the importance of cognitive stimuli for this mental simulation (KEESMAN et al., 2016). Without cognitive engagement there is a propensity for people to elaborate less on the information encountered and consequently, will use less cognitive resources during this simulation process (PRAXMARER, 2011).

Photographs have greater effectiveness in promoting more vivid mental simulation, when compared to works of art (KIM; CHOI; WAKSLAK, 2019; SEPTIANTO; KEMPER; PARAMITA, 2019), which occurs due to the ability to generate greater vividness, causing it to be processed more quickly and without as much mental effort (KIM et al., 2021), also contributing to irrelevant information being ignored (ADAVAL; SALUJA; JIANG, 2019). Photographs are able to increase information load with reduced cognitive effort, decreasing uncertainty during decision-making (ZINKO et al., 2020).

Cultural food consumption makes it explicit that the use of photographs increases food attractiveness (WU et al., 2021). When consumers' situational cognitive engagement is elevated, important memories and sensory cues increase and mental simulation becomes more detailed (YIM; KIM; LEE, 2020), as the human brain is better able to process visual effects than textual ones (LI et al., 2021). Thus, the use of photographs increases visual stimuli and concomitantly facilitates response (EDELL; STAELIN, 1983; YANG et al., 2017) and engagement by consumers compared to textual elements (LI; XIE, 2020).

Imagining a production system like Compost Barn, which is unknown to most consumers, can be extremely difficult to be explained using a textual description. Thus, Figure 3 shows an example of a photograph used to illustrate Compost Barn to facilitate consumers' understanding of this production system in dairy cattle farming.

Figure 3 - Dairy cattle in a Compost Barn installation system



Source: The author (2022).

Photo-elicitation is based on the insertion of a photograph in a survey and the use of photographs in questionnaires differs from the use of texts, because they provoke deeper elements of the human being (HARPER, 2002), such as memories of smells, sound and body experiences, such as heat (COLLIER; COLLIER, 1986), sharpening the memory and providing mental stimuli (BURT; JOHANSSON; THELANDER, 2007). Therefore, it can contribute in greater

understanding of the symbolic and physical meanings of the environment that has been constructed by photography (PETERMANS; KENT; VAN CLEEMPOEL, 2014).

Visual research methods have been used in several areas, such as advertising research, consumer behavior, and marketing research (SCHROEDER, 2003). They serve to obtain consumer perceptions and experiences (BURT; JOHANSSON; THELANDER, 2007).

5 CONCLUSION

Despite the constant and growing concern of consumers with environmental issues and animal welfare, the consumption of products from this type of production is still low, mainly due to socioeconomic issues and lack of knowledge about how the animals are produced. Therefore, the use of photographs in consumer research can facilitate the understanding and interpretation of production systems for a better consumer understanding of how the production of animals (poultry, pigs, cattle, fish, goats, sheep, and among other farm animal species) occurs. However, there is still a scarcity of works with photographs related to animal science, and these studies are opportune.

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