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MEAT PRODUCTION AND CONSUMPTION, TECHNOLOGY AND IMPACTS ON THE ENVIRONMENT

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ABSTRACT

The article intends to promote a debate focusing on meat consumption and its production on an industrial scale from the application of technology. It is intended to reflect on the dual aspect of technology applied to food processing and the implications for the environment. For this, information on meat consumption in Brazil and in the world and data on its production and its impacts on human nutrition and the environment are presented. The article also addresses the ethical issue in large-scale animal husbandry and brings possibilities for mitigating these effects in future generations.

Keywords: Meat production. Consumption. Technology. Environment.

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INTRODUCTION

This article proposes a debate about the production of meat on an industrial scale, its consumption, technology considering its positive and negative aspects and the impacts on the environment. Issues related to animal ethics, feeding and nutrition are addressed in order to contextualize aspects related to the consumption and production of meat. To this end, authors who reflect on the themes were chosen. For conceptualization purposes, meats with the muscle tissues of animals are considered here (ABL, 2008).

OVERVIEW OF MEAT CONSUMPTION

In the last 40 years, food consumption has been changing in developing countries. The transfer of production and processing technologies, economic development and economic stability are factors that interfere with these changes. Diets have become richer in carbohydrates, animal proteins, vegetable oils, and sugars, according to the Food and Agriculture Organization of the United Nations (FAO, 2020). During this period, there was an increase in meat consumption and, with that, threats to the environment grew. In Brazil, the economic stability due to the Real Plan doubled the *per capita consumption* of meat, which at the beginning of the series was 10 kg and in 2019 was 19.6 kg (cnabrasil.org, 2020). Part of this impact occurs due to industrialization in food production, which improves its technological means to produce more and better.

NUTRITION

As for food and nutrition, it can be highlighted that the industrialization of meat from animals raised in confinement promotes an imbalance in the ratio of Omega 3 and 6 fatty acids, which can reach 1:14 in beef when the ideal is that this ratio is 1:1 between omega 3 and 6, and can be accepted up to 1:3. The Omega 3 fatty acid in human nutrition is important for mental integrity and for the prevention of anxiety and depression. On the other hand, the greater the imbalance between fatty acids, the greater the risk of heart disease, allergies, depression and autoimmune diseases (RONDÓ JR., 2011).

Another concern in production on an industrial scale is the large consumption of corn in animal feed. Monocultures receive a high concentration of herbicides that end up reaching the table indirectly.

According to the WHO, in a meta-analysis study published in the journal Lancet by researchers from the International Agency for Research on Cancer (IARC), the

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consumption of processed meat in daily portions of 50g increases the risk of colorectal cancer by 18% (INCA, 2015).

INDUSTRIAL MEAT PRODUCTION

In a study by the Ministry of Agriculture, Livestock and Supply (2020), agribusiness projections were made for the period 2019/20 and 2029/30. Total meat production in 2019/20 is estimated at 28.2 million tons, and the projection for the end of the next decade is to produce 34.9 million tons of chicken, beef and pork. This variation between the initial year of the projection and the end results in an increase in production of 23.8%.

Considering the export aspect, the United States Department of Agriculture (USDA, 2020) classifies that Brazil will be, in 2029, the first exporter of beef, with 28.7% of total exports, with India being the second, followed by the United States and Australia. According to the Organization for Economic Cooperation and Development (OECD) and FAO, world beef production is projected to increase by 6 million tons of carcass equivalent (TEC) by 2029, and 81% of this increase will come from developing countries (MALAFAIA *et al.,* 2020).

In contrast to the increase in meat production, there is an increase in the importance that has been given to animal rights and the suffering to which animals are subjected to feed this industry, as can be seen below.

ETHICS AND MEAT PRODUCTION

Peter Singer, author of the book Animal Liberation, states that we do not usually think of what we eat as a matter of ethics. The author exemplifies the ethical treatment of indigenous hunters and gatherers who drew up codes about what types of animals they could kill and when. As for the ethics of animals, Michael Pollan argues that factory farms were designed on the principle that "animals are machines incapable of feeling pain" and that supporting this mode of production requires "a willingness to look away" from the fact that animals feel pain. The initial debate about meat and animals is on the issue of sentience and animal welfare (CADEIA INDUSTRIAL DA CARNE, 2016). The industrial production method causes prolonged animal suffering, as in the case of sows that remain in narrow stalls so that they cannot turn around; or chickens raised to grow faster than normal, as well as cows fertilized frequently and separated from their calves (SINGER and MASON, 2007).

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Datafolha conducted a survey in January 2017 and pointed out that 63% of Brazilians want to reduce meat consumption and 73% of the population feel misinformed about how meat is produced (WVEGAN, 2019).

IMPACTS ON THE ENVIRONMENT

Due to concerns about the environment, the document Agenda 21 was created at the United Nations Conference on the Environment held in 1992, which recommends the reduction and elimination of unsustainable patterns of production and consumption (Saúde and Soc., 2011). The impacts related to meat production occur due to the high consumption of water in production, consumption of grains for feed, the need for space for animals and the increase in the production of greenhouse gases. All these factors could have devastating impacts on the environment for generations to come.

In order to contextualize the theme, livestock uses 75% of the planet's arable land, especially for pastures and grain production for feed. The ecosystems of the Amazon and the Cerrado have suffered a strong impact due to the opening of pastures. For some analysts, Brazil is compromising its natural capital by exporting meat and feed without embedding the high environmental costs practiced on Brazilian soil (SCHUNK *et al.,* 2018). The entire area used for pastures and grain production is responsible for only 12% of the calories consumed in the world's food. It can be stated that there is protein inefficiency in converting the feed used in animal feed into human food when considering the costs of feeding the animals, which increases the environmental impact of diets based on high meat consumption (Saúde e Soc., 2011). According to Alejandro Acosta (FAO, 2018), livestock emits between 14% and 18% of total Greenhouse Gas (GHG) emissions worldwide, more than the transport sector. The author also points out that these emissions can be reduced by up to 30% with best practices and technologies. Regarding the consumption of grains as feed to feed animals, about 60% of corn/barley and 97% of soybean meal are used (AGUIAR and TURA, 2016).

Another issue of concern for sustainability refers to the use that livestock demands, which is in the order of 30% of the water resources destined to agriculture, which in turn involves 70% of all available fresh water (G1 AGRO, 2018).

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THE IMPORTANCE OF TECHNIQUES AND TECHNOLOGY IN CONTEMPORARY SOCIETY

CRITICISM OF TECHNOLOGY

The question that is proposed in relation to techniques and technology refers to how they can help humanity and from what point they become negative for human beings, animals and the environment. According to José Ortega Y Gasset (1883–1955), if it were not for technique, man would not exist (ORTEGA Y GASSET, 2009). The technique would have been necessary for humans in their natural state to survive, so they adapted better to them to meet their needs. From the development of techniques in a thoughtful way, man begins to modify nature to use it and thus becomes supernatural. For Oswald Spengler (1880–1936), techniques refer to the way things are done, such as, for example, the discovery of fire by Man (SPENGLER, 2013). The author deals with human evolution from technique and the evolution of language as fundamental factors for the formation of society. Throughout his development, man becomes a predator of nature and uses his resources to serve his own interests and his creations, such as the machine, for example. The author becomes a disbeliever in Western culture and proclaims the end of Western society due to man's own ambition for infinite power. In this regard, Spengler states that this end would be due to the extractive and modifying use of nature that man made and that his action would cause the depletion of natural resources. Finally, Spengler discusses the influence of technology in the dismantling of Western culture, uses the idea of science as a technique, arguing that science has become an imperative form of knowledge, almost like a law or dogma. For this reason, the author becomes pessimistic about the ways of the West and hostile to liberal and democratic values and institutions. Lewis Mumford (1895–1979) was a critic of technology and the myth of progress that accompanies technology. For Martin Heidegger (1889–1976), technique may not be the problem in itself, but it is not neutral, because nothing that comes from man is neutral (MUMFORD, 2013).

FAVORABLE ASPECTS OF THE TECHNOLOGY

Scientists and entrepreneurs have been developing technology to apply and produce substitutes for meat and other animal products. A study by FAIRR (Farm Animal Investment Risk & Return) in 2016 encouraged 16 global companies in the food industry to modify the way meat is obtained in their products, in order to replace animal meat with vegetable meat to mitigate the effects on health and the environment (FLUXO, 2019).

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According to the Brazilian Vegetarian Society (2018), the market for vegan products reaches, in addition to vegans and vegetarians, a growing portion of people who want to reduce the consumption of meat, milk and dairy products and eggs.

The technology that is used to expand the production of meat and meat products has been applied to increase the possibilities of producing substitutes for these foods. Industries in the food segment have been making investments in the vegetable protein and meat substitute market (SCHUNK *et al.,* 2018). In this case, the application of technology can be beneficial to society in contrast to the authors cited.

FINAL COMMENTS

As an alternative possibility for the next generations and for improving health, it is necessary to think about food consumption and production from a perspective of less impact on the sustainability of the environment. Reducing meat consumption may be essential to meet this goal (BRASIL, 2014).

Non-governmental organizations and society have mobilized through awareness campaigns to reduce meat consumption, such as the "meatless Monday". Likewise, the number of people who identify as vegetarians and vegans is growing. In Brazil, according to a recent survey by IBOPE Intelligence, 14% of the population declares itself vegetarian (SVB, 2018). The transition to a vegetarian diet, as well as a vegan one, requires availability to discover new flavors and be willing to make food choices different from individual habits. Switching to a fully vegan diet can be quite difficult at first, as Michael Pollan points out (SINGER & MASON, 2007). However, there are technologies available to offer products that are vegan versions of foods consumed regularly, such as hamburgers, nuggets, hams, kibbehs, drumsticks, sausages, sausages, ice cream, and cottage cheese (SVB, 2018).

Finally, according to mathematician Nicholas Georgescu-Roegen (1906–1994), faced with a situation of declining civilization and the possibility of an economic and environmental catastrophe, the alternative should come through the degrowth of anthropic activities as soon as possible. This degrowth should start with rich countries and the most polluting activities, reducing ecumene areas and increasing anecumene areas (SDGs, 2020).

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