



# Do Veterinarians Know and Accept Food Treatment by Radiation Technology? Development of Online Acceptance Questionnaire for the Assessment and Dissemination of technology.

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## 1. Introduction

Veterinary public health is involved in various fields related to animal food. Appropriate management of animal health status at slaughter and follow-up procedures throughout the entire production chain are incorporated into the work of Veterinary Food Inspectors. These veterinarians are also involved in assessing the epidemiological situation, making decisions in the event of a crisis such as the current pandemic with COVID 19. There is a growing demand for ongoing education and training to adjust the veterinary service to the dynamic changes in the industry and keep up with modern animal production [1]. Due attention should be given to training in food safety issues, since veterinary food inspectors must have excellent skills in this area, to always ensure and especially in a pandemic context and increasing hunger in the world, an excellent last contact with animals and maximum guarantee of quality and benefit for food, thus also reducing the waste present in the scenario of hunger and relevant in the contribution of gases as carbon [2].

Food irradiation is a conservation method that uses ionizing sources to increase food safety, shelf-stable meats, and multi-component foods, eliminating microorganisms pathogenic and deteriorating, however, not affecting the nutritional and sensory properties of the product when properly done [3].

Treatment of foods with irradiation is an effective means to prevent food-borne diseases which cause massive disruptions to the health and economic systems of societies as we observe these days [4].

The use of radiation in food follows specific legislation and is supported by arguments technical. In Brazil, the current legislation, enacted by the National Health Surveillance Agency (ANVISA), follows the international standards proposed by the Codex Alimentarius of the Organization of United Nations (UN), by the Food and Agriculture Organization (FAO) and by the International Atomic Energy Agency (IAEA) [5].

CASTELL-PEREZ & MOREIRA (2021) in Elsevier Public Health Emergency Collection reports that much work needs to be done to increase the technology's appeal as a food safety technology and that policy makers, regulators, and scientific experts should collaborate to find effective methods to achieve

this.

Today's world of instant information and the rise of online shopping and research can serve as an advantageous platform to increase consumer knowledge and acceptance of irradiated foods and professionals in the field such as veterinarians. The growing importance of online during global crises such as the COVID-19 pandemic cannot be underestimated.

Thus, the objective of this work was to develop a structured quantitative measurement instrument to assess the knowledge of veterinarians and to disseminate information about the treatment of food using Radiation technology.

## 2. Methodology

A questionnaire as an instrument for measuring subjective aspects was developed in a search management application launched by Google. The app, Google Forms, makes it possible to search and collect information about volunteer participants and provides registration forms. The online questionnaire can be shared by link and QR CODE in a wide, fast, and efficient way.

A previous questionnaire with assent by CEP number 1,219,936 developed with the stages of pre and last tests with experts in nuclear technology and food from IPEN-CNEN, as well as the lay public n=100 (presented in IMRP 2016 and INAC 2017) and applied in successful evaluation research with the CEAGESP Food Bank was used for adaptation. [6,7,8]

The questions included in the questionnaire are addressed to assess the perceived food risk among respondents and the knowledge, acceptability and neophobia associated with foods treated with ionizing radiation, as well the need to better understanding of the benefits associated to this technology. The questionnaire is comprised of three sections: socio-demographic characteristics, consumer food risk perception; knowledge and acceptance of food irradiation technology.

Answers are based on a three-point Likert scale (from 1 – always, to 0 –never). Dichotomous questions (Yes/No) have been mainly used.

## 3. Results and Discussion

The initial result is a questionnaire (Fig.1) for online data research that can be shared by link. O link <https://forms.gle/C41ExaepplhBcWq6> refers to the measurement instrument developed to assess the perception of students and professionals whose food quality assurance process can be assigned, as a veterinarian. This questionnaire can contribute to goal 3; ensure a healthy life and promote well-being for all and 13 take urgent action to combat climate change and its impacts posed by the United Nations through the dissemination of nuclear technology applied to food.

The initial result shows that media material developed by responsible, agencies, institutes, and specialists in Portuguese language is a possibility for future work to corroborate measurement instruments such as this online questionnaire. Similar studies using questionnaire at a large scale across countries would be extremely helpful and more research efforts are needed. The authors of this study share this product first for improve suggestions and recommend that in future work the instrument is tested in practice, to ensure that it is fit for purpose.

The image shows a digital questionnaire interface. It is divided into two main sections. The first section, labeled 'Seção 1 em 5', has a title 'Esta Pesquisa tem o Objetivo de Avaliação sobre a Percepção e Divulgação sobre o tratamento de alimentos pelo Processo de Irradiação.' Below the title, there is a short introductory text and a text input field for 'E-mail'. The second section, labeled 'Seção 2 em 5', has a title 'COMITÊ DE ÉTICA EM PESQUISA NÚMERO: XXX - TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO'. It contains a paragraph of text regarding the research risk and consent, followed by a consent form with a 'Múltipla escolha' dropdown menu.

Figure 1: structure questionnaire as an instrument for measuring the perception and dissemination of food treatment by ionizing radiation

## 4. Conclusions

Online questionnaires are excellent tools to collect data today and to measure in a structured way the subjective perception about the food irradiation process of research participants such as veterinarians. In addition, this questionnaire is also able to present concepts about radiation technology applied to food through statements of direct questions and media material such as inserted videos corroborating the dissemination of the process.

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## References

- [1] Wojtacka J, Wysok B, Sztejn J. Analysis of the Factors Influencing Veterinary Food Inspectors in Poland. *Animals (Basel)*. May 19;10(5):884. doi: 10.3390/ani10050884. (2020)
- [2] United Nations Environment Programme, Food Waste Index Report 2021. Nairobi, (2021).
- [3] Prakash A. What is the benefit of irradiation compared to other methods of food preservation? In: Andersen V., editor. 2020. *Genetically Modified and Irradiated Foods. Controversial Issues: Facts versus Perceptions*. Academic Press; (Chapter 9) [Google Scholar], (2020)

[4] Castell-Perez, M. E., & Moreira, R. G. Irradiation and Consumers Acceptance. *Innovative Food Processing Technologies*, 122–135. <https://doi.org/10.1016/B978-0-12-815781-7.00015-9>, (2021).

[5] BRASIL – ANVISA – Agência Nacional de Vigilância Sanitária – Resolução nº 21, de 26 de janeiro de 2001.

[6] Andressa Feitosa Rocha, Natália Nóbrega Ferreira, Adriana Régia Marques de Souza, Isadora Jacomini Flores, Valter Arthur, Aceitação e consumo de alimentos irradiados em Goiânia-GO *Brazilian Journal Of Veterinary Research And Animal Science* DOI: <https://doi.org/10.34188/bjaerv4n2-005> (2021)

[7] Gallo, Juliana Maria Altavista Sagretti. Avaliação da percepção de participantes do Banco de Alimentos da Companhia de Entrepósitos e Armazéns Gerais de São Paulo sobre o processo de irradiação de alimento. Divulgação do tratamento de alimentos por radiação ionizante: desenvolvimento de questionário e análise sensorial [tese]. São Paul, Instituto de Pesquisas Energéticas e Nucleares; 2018 [citado 2021-09-28]. doi:10.11606/T.85.2018.tde-19102018-143549.

[8] MODANEZ, L. Aceitação de Alimentos Irradiados: Uma questão de educação. 2012. Tese (Doutorado) – IPEN/USP, São Paulo.