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PRACTICAL DEMONSTRATION OF EGG QUALITY FOR UNIVERSITY EXTENSION STRATEGY FOR SANITARY AND FOOD EDUCATION: EXPERIENCE DURING THE NATIONAL WEEK OF SCIENCE AND TECHNOLOGY AT UFRRJ

DEMONSTRAÇÃO PRÁTICA DA QUALIDADE DE OVOS COMO ESTRATÉGIA EXTENSIONISTA DE EDUCAÇÃO SANITÁRIA E ALIMENTAR: EXPERIÊNCIA NA SEMANA NACIONAL DE CIÊNCIA E TECNOLOGIA DA UFRRJ

DEMOSTRACIÓN PRÁCTICA DE LA CALIDAD DE LOS HUEVOS COMO ESTRATEGIA EXTENSIONISTA DE EDUCACIÓN SANITARIA Y ALIMENTARIA: EXPERIENCIA DURANTE LA SEMANA NACIONAL DE CIENCIA Y TECNOLOGÍA DE LA UFRRJ

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Abstract: University extension activities are relevant strategies for the popularization of scientific knowledge, strengthening ties between universities and society through practical activities that stimulate active learning. The objective of this work was to analyze the potential of an extension activity based on practical activities as a health education strategy focused on evaluating the quality of eggs for consumption. The activity was developed during the 2025 National Science and Technology Week at the Federal Rural University of Rio de Janeiro and consisted of a practical course with a total workload of eight hours, involving faculty members and students of the institution, aimed at students and members of the external community. Participation occurred on a voluntary basis, with approximately 50 participants.
The methodology included addressing topics related to the visual assessment of egg quality, comparison between fresh and stored eggs, proper storage and hygiene practices, and clarification of myths about consumption, through practical demonstrations and accessible language. Data were obtained through direct observation, field notes, and participant reports, and were analyzed descriptively. The activity showed high level of public engagement, favoring the understanding of technical concepts, especially regarding shell integrity, the effects of storage on internal quality, and the risks of inadequate hygiene practices. Furthermore, changes were observed in participants' perception of everyday practices, such as washing eggs before storage. It is concluded that the extension activity demonstrated high potential as a strategy for sanitary and food education, contributing to the understanding of technical concepts and bridging the gap between scientific knowledge and everyday practices.
Keywords: *Scientific* dissemination; Food education; University extension; Eggs; Food technology

Resumo: Ações de extensão universitária constituem estratégias relevantes para a popularização do conhecimento científico, ao promoverem a aproximação entre universidade e sociedade por meio de atividades práticas que estimulam o aprendizado ativo. O objetivo deste trabalho foi analisar o potencial de uma ação extensionista baseada em atividades práticas como estratégia de educação sanitária voltada à avaliação da qualidade de ovos de consumo. A atividade foi desenvolvida durante a Semana Nacional de Ciência e Tecnologia de 2025, na Universidade Federal Rural do Rio de Janeiro, e consistiu em um curso prático com carga horária total de oito horas, envolvendo docentes e discentes da instituição, direcionado a estudantes e membros da comunidade externa. A participação ocorreu por demanda espontânea, com aproximadamente 50 participantes.
A metodologia contemplou a abordagem de temas relacionados à avaliação visual da qualidade dos ovos, comparação entre ovos novos e armazenados, práticas adequadas de armazenamento e higienização e esclarecimento de mitos sobre o consumo, por meio de demonstrações práticas e linguagem acessível. Os dados foram obtidos por observação direta, anotações de campo e relatos dos participantes, sendo analisados de forma descritiva. A ação apresentou elevada interação do público, favorecendo a compreensão de conceitos técnicos, especialmente quanto à integridade da casca, aos efeitos do armazenamento na qualidade interna e aos riscos de

práticas inadequadas de higienização. Além disso, foram observadas mudanças na percepção dos participantes em relação a práticas cotidianas, como a lavagem dos ovos antes do armazenamento. Conclui-se que a ação extensionista demonstrou elevado potencial como estratégia de educação sanitária e alimentar, contribuindo para a compreensão de conceitos técnicos e para a aproximação entre o conhecimento científico e as práticas do cotidiano.
Palavras-chave: Divulgação científica; Educação alimentar; Extensão universitária; Ovos; Tecnologia de alimentos.

Resumen: Las acciones de extensión universitaria constituyen estrategias relevantes para la popularización del conocimiento científico, al promover la interacción entre la universidad y la sociedad mediante actividades prácticas que fomentan el aprendizaje activo. El objetivo de este trabajo fue analizar el potencial de una acción extensionista basada en actividades prácticas como estrategia de educación sanitaria orientada a la evaluación de la calidad de los huevos destinados al consumo. La actividad se desarrolló durante la Semana Nacional de Ciencia y Tecnología de 2025, en la Universidad Federal Rural de Río de Janeiro, y consistió en un curso práctico con una carga horaria total de ocho horas, en el que participaron docentes y estudiantes de grado, dirigido a estudiantes y miembros de la comunidad externa. La participación ocurrió por demanda espontánea, con aproximadamente 50 participantes. La metodología incluyó temas relacionados con la evaluación visual de la calidad de los huevos, la comparación entre huevos frescos y almacenados, las prácticas adecuadas de almacenamiento e higienización y la aclaración de mitos sobre el consumo, mediante demostraciones prácticas y lenguaje accesible. Los datos se obtuvieron mediante observación directa, notas de campo y relatos de los participantes, y se analizaron de forma descriptiva. La actividad presentó una elevada interacción del público, favoreciendo la comprensión de conceptos técnicos, especialmente en relación con la integridad de la cáscara, los efectos del almacenamiento sobre la calidad interna y los riesgos de prácticas inadecuadas de higienización. También se observaron cambios en la percepción de los participantes respecto a prácticas cotidianas, como el lavado de los huevos antes del almacenamiento. Se concluye que las actividades extensionistas basadas en enfoques prácticos son herramientas eficaces para la educación sanitaria y alimentaria, contribuyendo a la difusión del conocimiento y fortaleciendo la relación entre la ciencia y las prácticas cotidianas.

Palabras clave: Educación alimentaria; Extensión universitaria; Huevos; Tecnología de alimentos; Divulgación científica.

INTRODUCTION

Eggs stand out as one of the most widely accepted and consumed foods of animal origin, especially due to their high biological value, culinary versatility, and affordability. Furthermore, they are significant sources of high-quality protein, lipids, vitamins, and minerals, playing a fundamental role in the food and nutritional security of the population (SILVA NETO et al., 2024).

However, the quality of the product available to the consumer depends directly on the conditions of production, storage, hygiene, and handling throughout the production chain. In

this context, the lack of adequate information and the circulation of misinformation about criteria for evaluating the quality, preservation, and consumption of eggs can compromise both food safety and consumer perception, favoring inadequate practices, waste, and sanitary risks (ALMEIDA et al., 2022; BARBOSA et al., 2025). Misinformation often spreads through informal channels. This can lead to inappropriate behaviors, such as improper egg washing or storage under inadequate conditions, which increase the risk of contamination and product deterioration.

In this scenario, studies indicate that attributes such as shell integrity, albumen consistency, and yolk characteristics are crucial for both product acceptance and safety for consumption (LIAO et al., 2023). These attributes reflect physical and chemical changes that occur from production to the moment of consumption.

Therefore, in order for these attributes to be correctly understood and evaluated, the use of technical parameters that allow for the objective measurement of egg quality becomes fundamental. Quality assessment involves external and internal parameters, which are influenced by factors such as the age of the bird, feed, rearing system, and storage time. Classic indicators, such as the Haugh Unit and the yolk index, are widely used to estimate the freshness and internal quality of eggs, and are recognized in the scientific literature as consolidated evaluation tools (HAUGH, 1937; EISEN et al., 1962; ALLEONI & ANTUNES, 2001).

Given the complexity of these factors, coupled with the need to combat misinformation and promote access to reliable knowledge, university extension assumes a strategic role by bringing the knowledge produced in higher education institutions closer to the demands of society. Extension activities contribute to the democratization of knowledge, the formation of more critical and conscious consumers, and the strengthening of the social commitment of the public university (SANTANA et al., 2025).

In this context, the 2025 National Science and Technology Week (SNCT-2025), held at the Federal Rural University of Rio de Janeiro (UFRRJ), is a privileged space for the development of extension activities, encouraging the popularization of science, the dissemination of knowledge, and dialogue between the university and the community. These initiatives promote positive impacts on health and food education, especially by enabling the translation of technical concepts into practices accessible to the public.

Given the above, the objective of this work was to analyze the potential of an extension activity based on practical exercises as a health education strategy focused on evaluating the quality of eggs for consumption.

METHODOLOGY

Characterization of extension activities

The extension activity consisted of conducting a course entitled "Practical Demonstration of Egg Quality," characterized as a university extension activity of the event-based activity, within the thematic area of Technology and Production. The activity was developed on October 24, 2025, with a total workload of eight hours, during the National Science and Technology Week (SNCT), promoted by UFRRJ. The analysis followed a descriptive qualitative approach, as recommended for experience report studies.

Location

The activities took place in the P1 building at UFRRJ, an environment with adequate infrastructure for educational activities and practical demonstrations, including space for interaction with the public and the use of teaching materials.

Target audience

The target audience consisted of undergraduate students, students involved in extension projects, faculty members, and members of the external community, including elementary and high school students interested in topics related to animal production and the quality of food of animal origin.

Implementing team and methodology

The executing team was formed by professors and students from UFRRJ's Animal Science, Agronomy, and Veterinary Medicine courses, who worked in an integrated manner in the planning, development of teaching materials, and execution of the activity, in accordance with the principles of university extension and the inseparability between teaching, research, and extension.

The methodology adopted prioritized hands-on and participatory learning, through applied demonstrations and dialogue with the audience. The following topics were covered during the activity:

• Visual assessment of the external quality of the eggs, considering the integrity, cleanliness, and color of the shell;

• Comparison between fresh and stored eggs, highlighting physical and qualitative differences;

• Guidance on proper storage at the point of sale and in the home environment;

• Clarifications on hygiene, myths and care related to washing eggs;

• Interactive discussion on curiosities, labeling and product selection criteria.

The data were obtained through direct observation by the implementing team, supplemented by field notes, photographic records, and spontaneous reports from participants throughout the activities. This information was organized, descriptively analyzed, and interpreted in light of the scientific literature on university extension, science education, and the quality of food of animal origin.

This process allowed for the elaboration of this article in the form of an experience report, with emphasis on methodological aspects, the profile of the target audience, and the educational potential of the action.

RESULTS AND DISCUSSION

The outreach activity yielded positive results, achieving its proposed objectives of scientific dissemination and food education related to egg quality. The initially estimated audience was 100 people, with approximately 50 individuals actively participated, including students, producers, and members of the local community (Figure 1). It is noteworthy that not all participants formally registered; there were also visitors who only observed the activities and interacted occasionally with the team, highlighting the open and dynamic nature of the outreach activity.

Figure 1. Public participation during the outreach activity developed during the National Science and Technology Week (SNCT 2025) at UFRRJ, highlighting the practical demonstrations related to the evaluation of the external and internal quality of eggs and guidance on storage and hygiene.

The active participation of the public during the practical demonstrations highlighted their interest in the topic and the suitability of the methodological approach adopted, a characteristic frequently associated with extension activities based on practical and dialogical activities. This initial engagement was fundamental for connecting between scientific concepts and the participants' daily reality. The main topics covered during the extension activity and their respective educational objectives are systematized in Table 1.

Table 1. Content covered in the extension activity "Practical demonstration of egg quality" and their respective educational objectives.

Content Covered	**Description of the Practical Approach**	**Educational Objective**
Evaluation of the external quality of eggs.	Direct observation of the shell regarding integrity, cleanliness, color, and presence of cracks, using commercial eggs as an example.	To empower participants to identify eggs that are unfit for consumption and understand the function of the shell as a physical barrier against contamination.
Comparison between fresh and stored eggs	Practical demonstration with freshly laid eggs and eggs stored for different periods, highlighting visual and internal changes.	Understanding the effects of storage time on the internal quality of eggs and the concept of freshness.
Evaluation of the internal quality of eggs.	Crack the eggs open on a flat surface to observe the consistency of the albumen, the height of the yolk, and the dispersion of its components.	Relating simple visual parameters to classic quality indicators, such as freshness and food safety.
Guidelines for proper storage	Interactive discussion on ideal storage conditions at the point of sale and in the home environment.	Promoting proper egg preservation practices, reducing health risks and quality losses.
Hygiene and handling before consumption	Clarification on correct and incorrect practices for washing and sanitizing eggs.	To demystify culturally widespread practices that may compromise the microbiological safety of the product.
Clarifying myths about egg consumption.	Dialogue with the public about popular beliefs related to the color of the shell, yolk, and nutritional value of eggs.	To encourage conscious consumption, based on scientific information and not on empirical perceptions.
Discussion about labeling and product selection.	Analysis of packaging and mandatory information on commercial egg labels.	Developing critical thinking skills at the time of purchase and strengthening consumer autonomy.

University-community interaction	An open forum for questions, sharing experiences, and testimonials from participants.	To strengthen the link between university and society, promoting the popularization of scientific knowledge.

Visual assessment of the eggshell stood out as one of the main points addressed during the activity, as it allowed for discussion of its function as the main physical barrier against microbiological contamination. This aspect is widely described in the literature as crucial for preserving the internal quality of eggs (de OLIVEIRA MARCIANO et al., 2025). The association between practical examples observed during the activity and theoretical concepts facilitated the assimilation of the content by the participants.

From this initial discussion, the comparison between fresh and stored eggs aroused great public interest, broadening the understanding of the effects of storage on product quality. Physicochemical changes that occur over time were addressed, such as the loss of water and carbon dioxide and the consequent increase in the air cell, phenomena widely described in the scientific literature (SOKOŁOWICZ et al., 2023).

Observational records indicated that most participants were able to correctly identify differences between fresh and stored eggs, as well as recognize inadequate hygiene practices at the end of the activity. Furthermore, the frequency of questions and participant reports demonstrated greater awareness of proper egg storage and consumption practices. The changes in perception observed throughout the activity highlight the importance of experiential learning in food education. By directly visualizing the quality differences and discussing everyday practices, participants were able to relate scientific concepts to their reality, which can foster more lasting behavioral changes.

Continuing the discussion, the guidelines on storage and hygiene allowed for a deeper exploration of the previously discussed topics, contributing to the demystification of inadequate practices frequently observed in daily life, such as the indiscriminate washing of eggs before storage. Although culturally widespread, this practice can compromise the integrity of the eggshell cuticle, increasing the risk of microbiological contamination and reinforcing the importance of evidence-based food education (KULSHRESHTHA et al., 2024). Previous extension experiences demonstrate that practical activities have a positive impact on promoting health and education in community contexts, while extension actions based on active methodologies have proven effective in bridging the gap between university and society,

favoring the collective construction of scientific knowledge (DE MELO et al., 2021; GONZAGA et al., 2024).

From an outreach perspective, the results observed throughout the activity highlight the university's role as an agent for promoting food security and scientific education. The literature indicates that educational actions developed within the university setting are effective in reducing information gaps, stimulating critical perception (DEUS, 2018), and promoting positive changes in human behavior (FORPROEX, 2012), especially regarding food consumption.

From an academic perspective, the active participation of students throughout the activity contributed to the development of skills related to scientific communication, social responsibility, and ethical professional conduct. These aspects are widely discussed in studies on university extension and reinforce the inseparability of teaching, research, and extension in the university context.

CONCLUSIONS

The outreach activity proved effective as a strategy for health and food education by promoting a practical understanding of egg quality and stimulating reflection on daily practices. The observed engagement and reported changes in perception reinforce the role of university outreach in bridging the gap between scientific knowledge and society. Future studies should evaluate the impact of these actions on knowledge retention and behavioral change among participants over time.

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