

Legal Industry

Maria Clara Costa da Silva +, Natalia Pereira Ribeiro, Lays Maila de Souza Oliveira, Gabrielly Estevan Dias, Jaenny Kewynny Santana de Sousa, Carla Heloisa Avelino Cabral

Universidade Federal de Rondonópolis ¹

Sustainable Development Goals / ONU Technology and Production

Abstract. This extension project focused on the production of animal feed, highlighting the importance of meeting the nutritional requirements of the species and ensuring food safety, in accordance with the standards established by the Ministry of Agriculture, Livestock and Supply (MAPA). The initiative, aligned with Sustainable Development Goals (SDGs) 8 – Decent Work and Economic Growth, 9 – Industry, Innovation and Infrastructure, 10 – Reduction of Inequalities and 12 – Responsible Consumption and Production, seeks to foster sustainable economic growth, stimulate job creation, reduce inequalities and encourage the use of responsible technologies. This cooperation promotes social transformation, competitiveness and business sustainability, reinforcing food security. Thus, the objective is to monitor the production of animal feed, promote compliance with current legislation and ensure the quality of the products prepared. The objective was to contribute to the qualification of production processes and operational practices in companies in the sector, promoting more organized, safe and technically appropriate environments. The methodology adopted involved a survey of companies registered with MAPA in the state of Mato Grosso, the application of a diagnostic form to identify production bottlenecks and the holding of conversation circles with professors, students and community representatives. On the basis of the results obtained, the Daily Safety Dialog (DDS) was implemented as a weekly practice at the Zootec industry, located in Rondonópolis-MT, addressing topics related to health and personal hygiene, cleaning of equipment and facilities (with a focus on the prevention of cross-contamination), mixing time and homogeneity, pest control, ingredient quality and good manufacturing practices (GMPs). Traditionally associated with occupational safety, the DDS was adapted as an educational tool focused on hygiene, quality and good industrial practices. In the first activity, whose theme was health and personal hygiene, nutrient agar was used to verify the presence of microorganisms on the hands of employees before and after the cleaning process, and the absence of fecal coliforms after the procedure was noted. Continuous educational practices, such as DDSs, strengthen the culture of hygiene and safety, improve the quality of inputs and contribute to the efficiency of the animal production chain.

Keywords: Animal feed, Good manufacturing practices, Daily safety dialog.

Introduction

The formulation of products intended for animal feed must meet the specific nutritional requirements of each species and category, ensuring metabolic balance, zootechnical performance and food safety without posing risks to public health or the environment. Feed production, regulated by the Ministry of Agriculture, Livestock and Supply (MAPA), ranges from the selection of suppliers to the shipment of the final product, ensuring quality and safety at all stages. In this context, Normative Instruction No. 04/2007 (BRASIL, 2007) makes the implementation of quality control programs mandatory, the effectiveness of

which depends on technical knowledge and compliance with legislation regarding labeling, registration and exemption of products and establishments. The integration and commitment of the entire production chain—technicians, employees, managers, suppliers, and consumers—are essential to reduce regulatory risk and ensure sustainable and safe production.

In recent decades, the Brazilian animal feed and supplement industry has undergone significant growth, with an increase of approximately 90% in national production, from 42 million tons in 2003 to 87 million tons in 2023 (SINDIRACÕES, 2023). This advance reflects the technological and

productive development of the sector, although challenges remain related to the standardization of processes, the qualifications of the workforce and compliance with current regulatory standards.

In view of this scenario, the extension project under development proposes training small companies and managers in the adoption of good manufacturing practices and quality programs to meet legal requirements and strengthen the integration between the university sector and the productive sector. The initiative, aligned with Sustainable Development Goals (SDGs) 8 – Decent Work and Economic Growth, 9 – Industry, Innovation and Infrastructure, 10 – Reduction of Inequalities and 12 – Responsible Consumption and Production, seeks to foster sustainable economic growth, stimulate job creation, reduce inequalities and encourage the use of responsible technologies. This cooperation promotes social transformation, competitiveness and business sustainability, reinforcing food safety and the quality of the products made.

Methodology

The project was developed in three main stages: (1) survey of companies registered with the Ministry of Agriculture, Livestock and Supply (MAPA) in the state of Mato Grosso; (2) elaboration and application of a diagnostic form, followed by analysis and discussion of the results between the executing team and community representatives; and (3) preparation of an action plan in the form of a case study for one of the selected companies, enabling an in-depth analysis and the proposition of specific solutions.

The survey of the companies was conducted from the database available on the official MAPA portal (<https://www.gov.br/agricultura/pt-br/pagina-inicial/#>), using the following navigation path: Menu → Subjects → Agricultural → Animal Defense → Products for Animal Feed → Establishments. The establishments were subsequently quantified by municipality in the state of Mato Grosso.

The diagnostic form was prepared through the Google Forms tool, which contains 16 objective and discursive questions related to production capacity, number of employees, activities developed, product categories registered, main production bottlenecks and specific demands for the project. After the responses were collected, a meeting was held with the quality team of the industry studied to discuss the findings and support the definition of the action plan.

Results and discussion

A total of 93 active animal feed industries were identified in the state of Mato Grosso, with relatively high concentrations in the municipalities of Cuiabá (15; 16%) and Rondonópolis (13; 14%). The diagnostic form was fully answered by three companies, which highlighted the lack of training in personal hygiene

and cross-contamination prevention measures as the main difficulties.

On the basis of these findings, an action plan was prepared that included the implementation of the Daily Safety Dialog (DDS) as a weekly practice in the Zootec industry, located in Rondonópolis-MT. Traditionally associated with occupational safety, the DDS was adapted as an educational tool to address topics related to hygiene, quality and good manufacturing practices. The topics defined for discussion included (1) personal health and hygiene; (2) cleaning of equipment and facilities, with emphasis on cross-contamination; (3) mixing time and homogeneity; and (4) integrated pest control and ingredient quality. In addition, comprehensive training on good manufacturing practices has been planned.

The first activity of the DDS addressed the theme of health and personal hygiene through a practical experiment involving the use of culture media (EMB agar, nutrient agar and MRSA agar) prepared under aseptic conditions in the Microbiology Laboratory. The objective was to demonstrate the importance of proper hand hygiene and the influence of environmental quality on product safety. In EMB agar, no growth of *Escherichia coli* was observed, whereas in nutrient agar, there was growth of unidentified bacteria and fungi. MRSA agar did not significantly affect growth. These results highlight the importance of hygiene practices to minimize the risk of cross-contamination and ensure the quality of the food produced.

According to Coelho and Toledo (2017), larger companies or companies with international insertion have greater adherence to good practices and quality programs, whereas micro and small industries face limitations in terms of access to management tools and understanding of legislation. In this sense, the implementation of the DDS represents a viable strategy for continuous training, with the potential to strengthen the organizational culture and raise quality standards.

The next DDS meetings are scheduled for October 10 and 24 and November 7, 2025, with specific training on good manufacturing practices scheduled for October 10, 2025.

Final considerations

The extension project demonstrated effectiveness in promoting good hygiene and quality practices in the production of animal feed, strengthening the organizational culture and awareness of employees regarding food safety and compliance with current standards. The active participation of students in all stages — from planning to the execution of educational actions — contributed significantly to the improvement of their academic training, promoting the development of technical, scientific and interpersonal skills and expanding their understanding of the agro-industrial sector. The continuity of activities, with new Daily Safety Dialogs (DDS) focused on cleaning, prevention of cross-contamination and good

manufacturing practices, reinforces the educational and transformative character of the initiative, which integrates the university and the productive sector in the search for sustainability, quality and competitiveness in the animal production chain.

References

ALLTECH, 2023. **Alltech Agri-Food Outlook shares global feed production survey data and influencing trends in agriculture.** Disponível em: <https://www.alltech.com/press-release/2023-alltech-agri-food-outlook>. Acesso em: 19 de fevereiro de 2024.

BRASIL. Ministério da Agricultura. **Instrução Normativa N.º 04, de 23 de fevereiro de 2007. Regulamento técnico sobre as condições higiênico-sanitárias e de boas práticas de fabricação para estabelecimentos fabricantes de produtos destinados à alimentação animal e o roteiro de inspeção.** Diário Oficial da União, Brasília, DF. 05 de março de 2007. Seção 01, páginas 1-17.

COELHO, R. P.; TOLEDO, J.C. **Programas para segurança na indústria de alimentos para animais: caracterização e benefícios percebidos com a implantação.** Gest. Prod., v. 24, n. 4, p. 704-718, 2017.

SINDIRACÕES, 2023. **Boletim Informativo do Setor Dezembro/2023.** Disponível em: boletim_informativo_setor_dez23_vs_final_port_sindiracoes.pdf. Acesso em: 02 março de 2024.