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INSERTION OF AGRONOMY AND ANIMAL SCIENCE COURSE STUDENTS IN BOVINE SLAUGHTERHOUSES, IN MATO GROSSO DO SUL, DIRECTS LEARNING: A RURAL EXTENSION PERSPECTIVE

INSERÇÃO DE ESTUDANTES DO CURSO DE AGRONOMIA E ZOOTECNIA EM ABATEDOUROS DE BOVINOS, NO MATO GROSSO DO SUL, DIRECIONA A APRENDIZAGEM: UMA PERSPECTIVA DE EXTENSÃO RURAL

INSERCIÓN DE ALUMNOS DEL CURSO DE AGRONOMÍA Y ZOOTECNICA EN MATADEROS DE BOVINOS, EN MATO GROSSO DO SUL, ORDENA EL APRENDIZAJE: UNA PERSPECTIVA DE EXTENSIÓN RURAL

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Resumo: A extensão rural, é uma ferramenta, que vem se tornando essencial para implantação de forma eficiente e rápida de boas práticas agrícolas e pecuária, buscando o desenvolvimento das propriedades rurais. A realização do estágio proporciona ao aluno crescimento profissional e pessoal, visto que ao ter a oportunidade de acompanhar a rotina da sua futura profissão, possibilita o aperfeiçoamento do aprendizado. Nesse contexto, o artigo, foi explorado a inserção de estudantes dos cursos de Agronomia e Zootecnia, na produção de carne bovina, nas propriedades e nos abatedouros frigoríficos de bovinos. Diante dos aspectos, relatados, podemos afirmar que a realização deste estágio contribuiu para proporcionar novas vivências para essas alunas, sobretudo na extensão rural e qualidade da carne. Possibilitando aprimorar e consolidar conhecimentos sobre bovinocultura, nutrição animal, manejo sanitário, abate e qualidade de carne explanado de forma de palestras e reuniões aos produtores rurais. Com a realização das atividades durante o estágio, serviu para influenciar a formação profissional. As atividades mostraram-se de extrema relevância na construção de conhecimento teórico-prático entre os envolvidos, indústria, empresa, alunos e produtores e as sugestões passadas para os produtores proporcionou formações diferenciadas pois abrangeu diversas áreas da cadeia produtiva de bovinos de corte.
Palavras-chave: Estágio, extensão rural, inspeção sanitária.

Abstract: Rural extension is a tool that has become essential for the efficient and rapid implementation of good agricultural and livestock practices, seeking the development of rural properties. Carrying out an internship provides the student with professional and personal growth, as having the opportunity to follow the routine of their future profession allows them to improve their learning. In this context, the article explored the insertion of students from Agronomy and Animal Sciente courses in beef production, on properties and in beef slaughterhouses. Describing the targeted experience and learning of students on carcass yield and meat quality, highlighting the importance of the partnership between the University, producers and agribusinesses. During the months of November 2022 to January 2023, students from the Agronomy and Zootechnics courses followed the activities of a company in the state of Mato Grosso do Sul, which carries out technical monitoring of slaughter, and provides consultancy to improve the quality of beef. Given the aspects reported, we can say that carrying out this internship contributed to providing

new experiences to these students, especially in rural areas and in pre-slaughter management. Making it possible to improve and consolidate knowledge about livestock farming, animal nutrition, health management, slaughter. By carrying out activities during the internship, it served to influence professional training. The activities proved to be extremely relevant in the construction of theoretical-practical knowledge among those involved, industry, company, students and producers and the suggestions given to producers provided differentiated training as it covered different areas of the beef cattle production chain.

Keywords: Health inspection, internship, rural extension.

Resumen: La extensión rural es una herramienta que se ha vuelto esencial para la implementación eficiente y rápida de buenas prácticas agrícolas y ganaderas, buscando el desarrollo de las propiedades rurales. Realizar unas prácticas proporciona al estudiante un crecimiento profesional y personal, ya que tener la oportunidad de seguir la rutina de su futura profesión le permite mejorar su aprendizaje. En este contexto, el artículo exploró la inserción de estudiantes de las carreras de Agronomía y Zootecnia en la producción de carne vacuna, en propiedades y en mataderos de carne. Describir la experiencia objetivo y el aprendizaje de los estudiantes sobre rendimiento de canal y calidad de la carne, destacando la importancia de la alianza entre la Universidad, los productores y los agronegocios. Durante los meses de noviembre de 2022 a enero de 2023, estudiantes de los cursos de Agronomía y Zootecnia siguieron las actividades de una empresa del estado de Mato Grosso do Sul, que realiza seguimiento técnico del sacrificio y brinda consultoría para mejorar la calidad de la carne vacuna. Considerando los aspectos reportados, podemos decir que la realización de esta pasantía contribuyó a brindar nuevas experiencias a estos estudiantes, especialmente en el ámbito rural y la calidad de la carne. Permitiendo mejorar y consolidar conocimientos sobre ganadería, nutrición animal, manejo sanitario, sacrificio y calidad de la carne explicados a través de charlas y encuentros a productores rurales. La realización de actividades durante la pasantía sirvió para incidir en la formación profesional. Las actividades resultaron de suma relevancia en la construcción de conocimientos teórico-prácticos entre los involucrados, industria, empresa, estudiantes y productores y las sugerencias brindadas a los productores brindaron una formación diferenciada al abarcar diferentes áreas de la cadena productiva del ganado vacuno.

Palabras clave: Extensión rural, pasantía, inspección sanitaria.

INTRODUCTION

With the increase in population in relation to human health, the need for more rural extension workers increases, focused on the cattle slaughter process, working directly in slaughterhouses to guarantee a good carcass yield, consequently quality meat, these aspects being for producers and consequently for consumers who increasingly seek good quality products (SILVA *et al*., 2022).

The global demand for feed of animal origin is growing. Brazil is a major global producer and exporter of meat products, holding the largest commercial herd in the world, with around 234.34 million animals (IBGE, 2022). In 2022, the state of Mato Grosso do Sul had a herd of 18.4 million cattle, slaughtering around 3,276,271 heads in the same year, being the third state that produced the most beef, behind Mato Grosso (4,697,425) and São Paulo (4,697,425) (ABIEC, 2023).

Over the next 10 years, beef production in the country is expected to grow by more than 12.36%. However, to achieve this production, with quality and sustainability, reaching good levels of yield and quality of carcasses, and consequently of meat as a final product, there is still a lot to invest in nutrition, pasture, health management, genetics and in the qualification of the workforce. (MALAFAIA & BISCOLA, 2023).

Agronomist and Animal Science are highly qualified professionals necessary to work with rural extension, providing technical assistance to producers. These professions work in the areas of animal production, pasture and forage, always seeking maximum productive efficiency, with a broad vision over the entire diversification of producers' production (POSSATTO, 2022).

Rural extension is a tool that has become essential for the efficient and rapid implementation of good agricultural and livestock practices, always seeking the development of rural properties. In this context, Universities are increasingly creating extension programs, which aim to solve problems faced by producers, inserting students into the production environment, with the support of teachers, seeking to train future professionals, with experience in the area of training (POSSATTO, 2022).

According to Muniz et al. (2022), by giving students the opportunity to use the theoretical knowledge acquired in the classroom in practice, even during graduation, it

allows them to learn about new technologies and become safer professionals, in addition to having the opportunity to learn about different areas of activity.

Carrying out an internship provides the student with professional and personal growth, as by having the opportunity to follow the routine of their future profession, it allows them to improve the learning acquired during their academic training, in addition to a more realistic view of the job market and of future responsibilities (ANDRADE *et al*., 2020).

With the technification of beef cattle farming, monitoring slaughter in slaughterhouses is becoming a fundamental practice to guarantee the quality of the carcasses and an efficient yield. However, there are several problems in pre-slaughter management, which are generating the need for more rigorous monitoring. These problems begin from the moment the animals are loaded onto the property, through bleeding, which is considered a critical point, and ending with cooling.

Faults and irregularities in slaughter procedures, such as non-compliance with health and animal welfare standards, directly influence the quality of the meat. These losses are aggravated by the lack of adequate training of the professionals involved, making it a major challenge in the industry to qualify these professionals, aiming to reduce economic losses and risks to public health, which causes negative impacts on the beef production chain (MENDONÇA *et al*., 2016).

Given this scenario, the inclusion of students focused on agricultural sciences as students of Agronomy and Animal Science courses in cattle slaughterhouses appears as an important strategy to direct learning and contribute to rural extension (MENDONÇA *et al*., 2016).

In this context, the article explored the insertion of students from Agronomy and Animal Science courses in beef production, rural producers and beef slaughterhouses. Describing the targeted experience and learning of students and the way they express this knowledge, can highlight data on carcass yield and meat quality, highlighting the importance of the partnership between the University, producers and agribusinesses.

MATHERIAL AND METHODS

During the months of November 2022 to January 2023, students from the Agronomy and Animal Science courses followed the activities of a company in the state

of Mato Grosso do Sul, which carries out technical monitoring of slaughter, and provides consultancy to improve the quality of beef to rural producers.

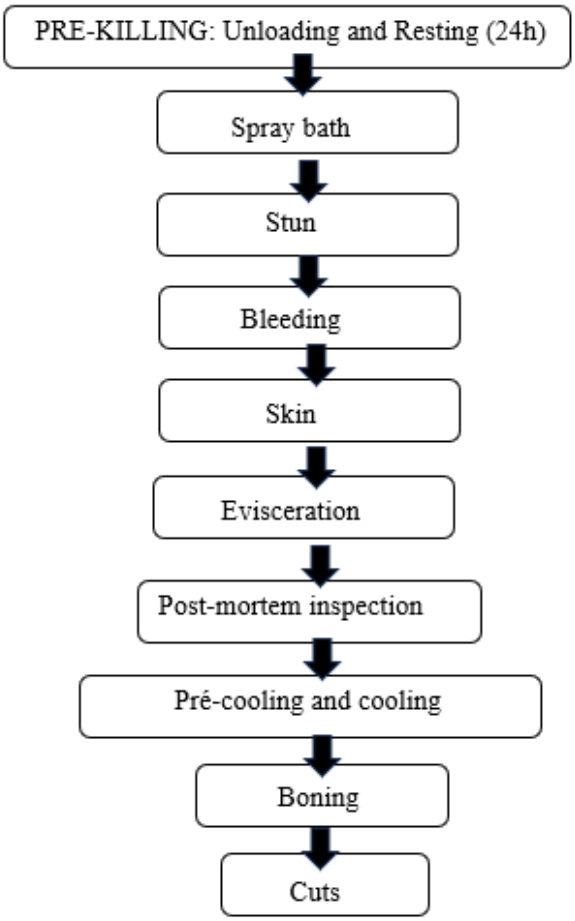
The students accompanied around 10 slaughters, with an average of 150 animals per batch, in cattle slaughterhouses, located in the cities of Campo Grande, Naviraí and Aparecida do Taboada, in the state of Mato Grosso do Sul.

During this period, the students accompanied the batches of animals slaughtered from rural producers, who receive technical assistance from the company, throughout the slaughter process, from unloading management, ante-mortem inspection, driving and washing the animals, stunning and bleeding, evisceration, carcass inspection and weighing lines (Flowchart 1).

During the evaluation stage, if any anomaly was found, such as cysticercosis, tumors, the carcasses were sent to the FID (final inspection department), together with all their parts (carcass, head, tongue, heart, diaphragm and esophagus, and chewing muscles) to be analyzed and obtain a judgment on destination and treatment.

All changes found in each batch were noted so that this information could later be used to prepare the detailed report.

Flowchart 1. Bovine Abbot Operations Flowchart.



At the end of slaughter, data relating to each batch was collected, where preliminary summaries were generated to be sent to producers, and later a detailed summary, with data for each animal, to assist producers. Through lectures and meetings with rural producers, extensionists were guided, with explanations of management, breeding and slaughter of animals so that future decision-making could be adjusted in the next batches, aiming to increase profits.

Added to this context, throughout the internship period the students had the opportunity to ask questions to the teachers, and at the end, a conversation circle was held so that the students could share their experiences during this period, with the aim of developing the interest of other students in participating in internships, in addition to exchanging knowledge.

RESULTS AND DISCUSSION

Within the context in which it covers private companies, rural producers, slaughterhouses and students, according to MENEGAT et al. (2019) the extension involves actions that include organization in groups, forming collectives to implement activities, strengthening sociability between the neighborhood, as well as solidarities and thereby bringing together energy and strength to act on work scales and companionship between participants at various stages of the process. This methodology allows them to extend dialogues with external institutions, such as the partnership with professors from the Federal University of Grande Dourados\UFGD, in a joint effort and enabling the multiplication of extension actions.

During the internship period, Agronomy and Animal Science students\UFGD course monitored the slaughter of 1500 cattle, of which 15 carcasses were condemned (Figure 1). Among the main causes, bruises stood out, accounting for 41.17% (7 animals) of convictions, 17.64% (3 animals), cysticercosis, 17.64% (3 animals) due to tumor, and 11.74% (2 animals) due to abscesses and 11.74% (2 animals) due to other causes (Graph 1).

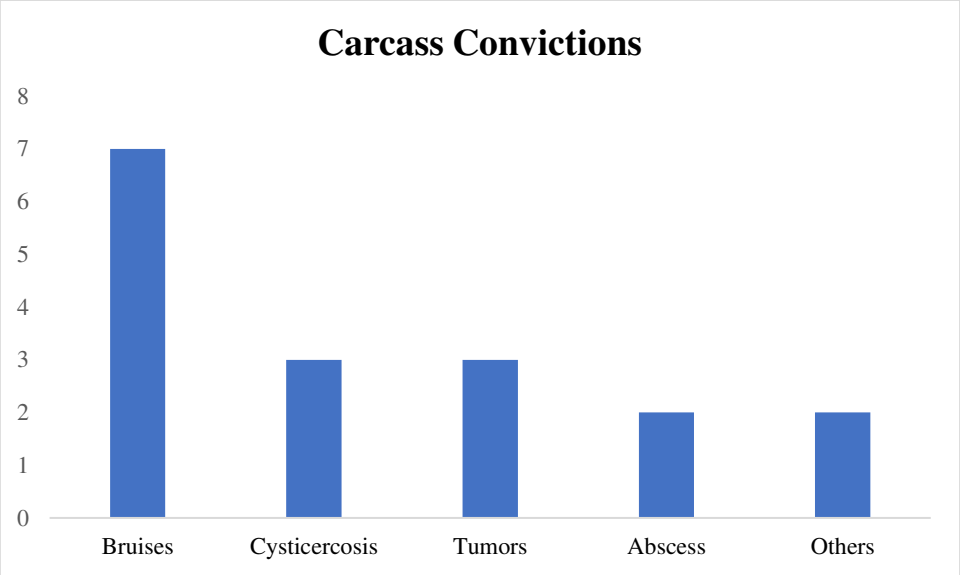


Figure 1. Causes for condemnation of bovie carcasses.

According to Almeida et al. (2017), total convictions associated with widespread contusion and contamination, with different proportions in the states studied in Brazil, varies between 28.53% and 50%. Being influenced mainly by inadequate sanitary management and transportation.

Cattle carcasses condemned due to cysticercosis, tumors, abscesses or other types of pathology, cause economic losses for the slaughterhouse due to their destination, which is the grease plant. The impact of this type of condemnation on the economic sector gives

the meat market a negative image of Brazilian meat production, as they are pathologies that are easily controlled.



Graph 1. Main causes of condemnation of carcasses of cattle slaughtered during the internship.

The lack of preparation of the people responsible for transporting animals is a major bottleneck for the meat production chain, as inadequate transport, whether due to an excess of animals or high speed, can cause deaths and injuries of varying severity, in addition to stressing the animals, influencing negatively on the quality of the meat, generating meat of the DFD type, which means dark, firm and dry meat.

Another point that caught the students' attention was in relation to the fat score. One of the batches monitored by the company had animals with excess fat on the carcass, around 50% of the animals have an excessive fat score, that is, above 3 points (Figure 2).

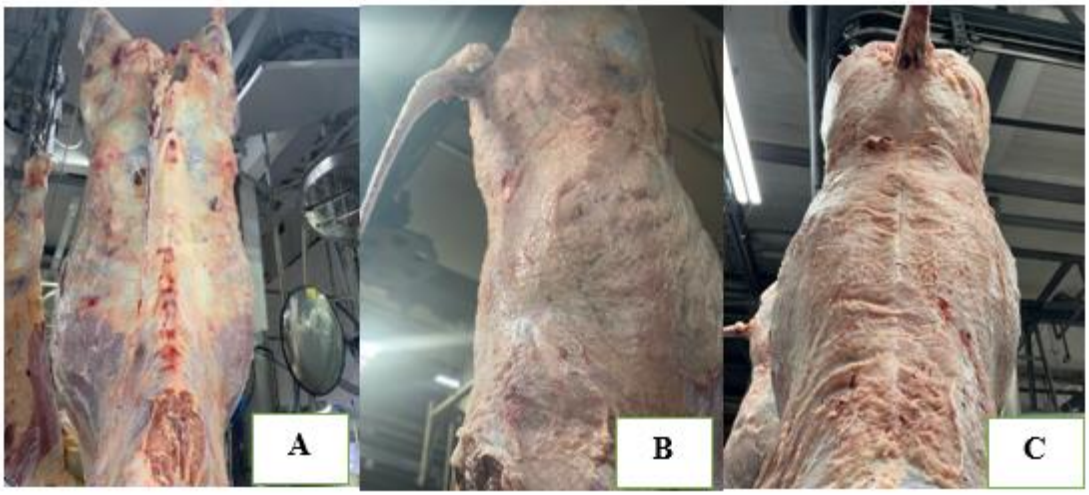


Figure 2. Classification of carcasses during the internship. A: absence of fat; B: average fat (desirable); C: excessive fat.

According to Philippe et al. (2020), the score to classify the finish of beef carcasses varies from 1 to 5, where 1: absent fat, 2: scarce fat; 3: medium fat (adequate); 4: uniform fat (adequate); and 5: excessive fat. Very lean carcasses, with little or little fat coverage, are not desirable as they lead to the fibers being shortened by the cold in the cooling chamber, resulting in a reduction in the tenderness of the meat.

Carcasses with excess fat, on the other hand, require adjustments in meat processing, as the excess will have to be removed which generates increased costs for slaughterhouses.

With the great inequality of the lot, the producer is losing money through excessive expenditure on feed, as the cost of fat deposition is much higher than the cost of muscle deposition. This happened because the batch was heterogeneous in relation to the age of the animals, which ranged from 24 to 32 months, and in relation to genetics, as it had approximately 50 Holstein x Zebu (Gir) crossbred animals, and the other 100 animals were Nellore, more precocious.

Genetics is one of the main factors that influence the quality of fat, as it directly affects the lipid content and the amount of total fatty acids in the meat, contributing to the flavor and aroma of the meat. It is known that fat influences the quality and nutritional value of carcasses, as it has the function of protecting against the cold, acting as a thermal insulator, in addition to being an important source of essential fatty acids, fat-soluble vitamins and a source of energy. (CLÍMACO *et al*., 2011).

Batches with cysticercosis, as it is a food-borne disease, directly affecting public health, were recommended to improve sanitary conditions, appropriate application of drugs that can control helminth infection, in addition to taking care of the issue of water that is supplied to the animals.

As for the heterogeneous batch of animals, after an analysis, it was recommended for the next batches to separate the cattle by genetics and age, so that an appropriate diet could be formulated for each category, thus making the batch more homogeneous at slaughter, in addition to reducing food costs and penalties for having unsuitable animals.

After the end of the slaughters, the students participated in the preparation of preliminary summaries and later, in the detailed summaries sent to the producers, which highlighted the positive and negative points of each batch. Through lectures and meetings, technical and social knowledge was contextualized, in an extensionist scope, which involved passing on this information, covering the actions of students to rural producers and everyone involved in animal husbandry.

Rectifying these actions described in the previous paragraph, according to Muniz et al. (2021) with the aim of presenting the results obtained with a university extension action based on the Compost Barn confinement, they used it as a way of transferring the extension action in carrying out courses with other groups assisted with extension actions, being published in meetings with small producers, settlers and quilombolas, multiplying the scope of the action.

This feedback between slaughterhouses and producers, carried out by companies focused on the quality and yield of carcasses, producing meat as a quality final product with the participation of academics, enabled learning in practice, in addition to monitoring the entire meat production process, in the cold. refrigerators, a comparison can be made with all the theory studied and observe the particularities present in this production system.

For Barbosa et al. (2020) when carrying out an analysis of the activities of the university integration program with the countryside – PROIN, at the State University of Montes Claros, Janaúba Campus, located in the North of Minas Gerais, regarding the visits made by Animal Science students in a strategic way aiming to integrate university students into rural reality, it allowed technical improvement regarding practical undergraduate activities. It was concluded that PROIN activities are of great importance for training students for their future professional life, allowing them to experience field

practices in an interactive way. For producers, visits are important due to the exchange of knowledge.

Furthermore, by making this experience possible, other student were motivated to do internships, which are not mandatory, seeking to increase learning, learn about new things, and see in practice what is taught in theory in the classroom.

The results obtained showed that the students who participated in the internship gained new knowledge about cattle slaughter, meat quality, the importance of carrying out sanitary management, as well as diet formulation and how genetics influence carcass components. The students became information multipliers and builders of new knowledge, building directly in the classroom.

CONCLUSION

Given the aspects reported, we can say that carrying out this internship contributed to providing new experiences to these students, especially in rural areas and in pre-slaughter management. Making it possible to improve and consolidate knowledge about livestock farming, animal nutrition, health management, slaughter.

By carrying out activities during the internship, it served to influence the professional training of these students, in addition to influencing new students to undertake internships. The activities proved to be extremely relevant in the construction of theoretical-practical knowledge among those involved, industry, company, students and rural producers and the suggestions given to producers provided differentiated training as it covered different areas of the beef cattle production chain.

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