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ORIGINAL

Analysis of the social perception of a producer about the pig production system and his experience with alternative feeding

Análisis de la percepción social de un productor acerca del sistema de producción de cerdas y su experiencia con la alimentación alternativa

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ABSTRACT

This study was carried out in the municipality of Florencia Caquetá. The purpose of the following investigation was to analyze the social perception of a producer of breeding sows, regarding the production system and their experience in the use of alternative feeds, for which the interview was used as an information gathering tool. Data was found around three important families for the producer, the first was the productive technical part, which covered everything related to the productive process, taking topics such as genetics, reproduction and hygiene. The next family was economics, dealing with topics such as marketing, inflation, the market, and profitability. Finally, the pig family, where the importance of knowledge, dedication and replicating the same knowledge was highlighted, thus understanding the motivations of the producer, how he visualizes his future production and wanting to share his knowledge with other producers who want to venture in new ways of producing bristles.

KEYWORDS

Production, Sows, Feeding, Knowledge, Dedication

RESUMEN

El presente estudio fue realizado en el municipio de Florencia Caquetá. El propósito de la siguiente investigación fue analizar la percepción social de un productor de cerdas de cría, en cuanto al sistema de producción y su experiencia en el uso de alimentos alternativos, para lo cual como herramienta de recolección de información se utilizó la entrevista. Se encontraron datos entorno a tres familias importantes para el productor, la primera fue la parte técnico productiva, que abarco todo lo referente a el proceso productivo, tomando temas como la genética, la reproducción y la higiene. La siguiente familia fue la economía, tratando temas como la comercialización, la inflación, el mercado y la rentabilidad. Por ultimo la familia porcicultor, donde se resaltó la importancia del conocimiento, la dedicación y la replica de los mismos conocimientos, entendiendo así las motivaciones del productor, como visualiza este su producción a futuro y el querer compartir sus conocimientos a otros productores que quieran incursionar en nuevas formas de producir cerdas.

PALABRAS CLAVE

Producción, Cerdas, Alimentación, Conocimientos, Dedicación

INTRODUCTION

Pig farming is defined as any activity that implements the breeding, feeding, and marketing of pigs for human consumption (Cortés, 2020). This is a very attractive activity due to its short gestation periods (114 days), obtaining large litters of piglets (24-30 female piglets/year), so its production is very large.

Worldwide production

According to FAO (2010), cited by Cortés (2020), Asia is the continent with the highest production, exceeding 523 million animals; China is the largest producer of live pigs in the world, so it is often said that one out of every two pigs in the world is of Chinese origin. According to Córdova et al. (2020), the world census of the number of pigs in the world is approximately 960 million heads, with statistics of 60 % in Asia, 20 % in Europe, and 16 % in America.

Of all the pig production in the world, there are 42 producing companies with more than 100,000 sow places, having approximately 16,07 million animals. Mainly, these companies are concentrated in China, the United States, and Brazil, with China being the biggest company in the world. Muyuan Foodstuff Company with 2,83 million sows.

Pig breeds are divided into two categories: meat breeds and maternal breeds; in the case of maternal breeds, they are characterized by producing large litters of piglets and their ability to raise these with higher success rates; the main maternal breeds are Yorkshire, landrace, Chester with and Tamworth (Ghio & De La Sota, 2014).

According to the association Porkcolombia (2021), raw materials such as whey, banana, yucca, bore, buttercup, fruits, vegetables, soldier fly larvae, hatchery, sugar cane, and cut grass, among others, can be used.

The use of these alternatives brings satisfactory results such as that of Cevallos (2022), who, after conducting research in Babahoyo - Los Ríos - Ecuador, on the use of sweet potato (Ipomoea batatas), concluded that "implementing a daily ration of sweet potato from 1,8 kg to 3,0kg depending on the weight of the animal, also implemented in conjunction with the balanced feed derived from the same sweet potato, they are an alternative in the feeding of pigs by the positive effect of weight gain and feed conversion, replacing 70 % of the diet.

Although the swine sector is important worldwide, it also causes environmental problems. Several studies have shown that the main problem generated by the swine industry is pollution caused by pig excreta, which chemically contains nitrogen, phosphorus, and some heavy metals (López, 2021).

Taking into account the above, the intensification of swine farming can have negative impacts on the environment, as expressed by (S.L - GAMA, 2019 cited by López (2021): water pollution based on nitrates or ammonium, eutrophication of water also by nitrogen (N) and phosphorus (P), air pollution, mainly by ammonia, nitrogen oxides, sawdust, aerosols or microorganisms, acidification of the air mainly by hydrogen sulfide, creation of greenhouse gases, especially methane and nitrous oxide, high water consumption, local nuisances such as odors, noise, and dust, the spread of heavy metals, pesticides, and toxic substances, the spread of heavy metals, pesticides, and toxic substances, dissemination of pesticides and toxic substances, especially methane and nitrous oxide, high water consumption, local nuisances such as odors, noise, and dust, the spread of heavy metals, pesticides, and toxic substances, dissemination of microorganisms, including antibiotic-intolerant pathogens and traces of veterinary drugs in water and soil (p.7).

Domestic production

In Colombia, According to the 2020 National Livestock Census of the agricultural sector developed by the Colombian Agricultural Institute -ICA, cited by Finagro: fund for the Financing of the agricultural sector (2020), there are 6,710,666 pigs in the country, 61 % of which belong to farms with technified systems and the other 39 % are backyard animals. The 68.7 % of animals present in Colombia are distributed in 6 departments: Antioquia (29.8 %), Valle del Cauca (13.9 %), Cundinamarca (9.2 %), Córdoba (6.3 %), Meta (5.0 %) and Bolívar (4.5 %) (Finagro, 2020). Likewise, according to Finagro (2020), there are approximately 233 thousand pig farms in Colombia, mostly concentrated in the departments of Córdoba, Sucre, Bolívar, and Antioquia.

Within the pig farms, especially the central Andean region of Colombia (RACC), The most common breeds are Yorkshire (23 %), Pietrain (21 %), Duroc (19 %), Landrace (17 %), Landrace-Belgian (11 %) and Hampshire (9 %), being the Landrace-bargain the most used as for maternity (Trujillo et al., 2021).

According to a study conducted by Vanegas et al. (2019), in Colombia, bore is an alternative for pig feeding since:

- The nutritional composition of a bore (Alocasia mycorrhiza) depends on the part of the plant that is fed to animals, such as the root, stem, whole leaf, petiole, or leaf parenchyma. The bore stem contains 16.3 % dry matter and Rev Sist Prod Agroecol. 3: 2: 2012 48 6.9 % crude protein (Bastos, 1995). These values allow the potential utilization of bore in sustainable small-scale swine production systems (p. 48).

Production in Caquetá

In the department of Caquetá, 34,006 pigs have been identified, and it is expected that by the end of 2018, the figure will increase to 80,000 animals. On the other hand, according to the Colombian Agricultural Institute-ICA (2021), it mentions that, in terms of pig farming, there are 2,886 pig farms in Caquetá, of which 73,5 % are free-range farms with no more than 10 pigs, and 26,4 % are family or commercial, industrial pig farms, with an average of 50 pigs and only 0,1 % of the farms are specialized in technical pig farming, with an average of 1,132 pigs.

In the same way, most farms use whey because it is a very affordable product; in addition to organic household waste, cassava, banana, sugar cane, and bore are used as dietary supplements and, in some cases, to a lesser extent, they use concentrate (Martinez et al., 2023). Such feeding reflects that used in most pig farms, shows the lack of knowledge of farmers in nutritional and dietary principles, which reflects the low production of pigs as the animal takes longer to fatten because the weight gain would is low, increasing the cost of feeding to such an extent that production becomes unsustainable or uneconomic (Maner et al., 1975).

In spite of all the limitations, there are producers such as the case of the Los Jaguares farm, which has bet on alternative feeding. This farm has 3 breeding sows, which can have litters of up to 15 pigs. They are fed 65 % green fodder, such as bore, acceder, banana leaves, cuchiyuyo, and yucca, and 35 % concentrates. This type of feed is complemented with concentrates so as not to lose meat quality and not to generate too much bacon in the pig since the use of 100 % plants or dairy products causes a thickening of the pig's bacon, as stated by the producers themselves. The case of the Jaguares farm, which, through different trials, has managed to implement a different diet with favorable results, but the lack of knowledge of the dynamics of the experience makes it impossible to know what the factors that have determined the success and maintenance of the production of sows for breeding with alternative feeding so that this can be useful to other producers. Therefore, it is necessary to know the social perception of the producer about the sow production system and his experience with alternative feeding.

METHODS

Location

The present study was carried out at the Los Jaguares farm in the municipality of Florencia (1° 36' 50'' North and 75° 36' 46'' West), located in the Department of Caquetá, in the south of Colombia in the Amazon region.

The study involved a farmer with extensive experience in the production system of breeding sows and the transition from the use of conventional feed to alternative feed, where he uses a wide variety of forage plants with which he has managed to replace up to 65 % of the feed they require.

The exercise that was developed is based on the Historical Hermeneutic paradigm since it implies that reality is constructed by the actors participating in the situation; from this perspective, the dynamics of the object of study are approached with the purpose of understanding and interpreting daily events, social structures, as well as the meaning that people give to the phenomena (Gutierrez, 2014). The approach used was qualitative since the instruments used for data collection focus on qualitative variables.

Method

Analysis of the social perception of the producer about the sow production system and his experience with alternative feeding.

For the production of qualitative data, the interview tool was used, where aspects such as the history of the experience, reasons that prompted him to work with breeding sows, reasons why he made the transition process in feeding, the results obtained, challenges, challenges and finally the recommendations were addressed.

For the analysis of the data obtained in the interview, it was transcribed into plain text, where the information was separated into texts with codes that were processed by the qualitative data analysis software Atlas ti 9.0, where output diagrams were generated as word cloud, deductive analysis (network) and Sankey diagram, which were described and discussed as part of the results and findings that were obtained.

RESULTS AND DISCUSSION

The results of the research are presented below. In the first approach, the exploratory analysis is presented, whose output graph is a word cloud; then, at a deeper level, the deductive findings are presented, represented in network diagrams by identified code family. Finally, the inductive result of one of the documents that guided the present research is shown, in this case, through a Sankey diagram.

Exploratory analysis-word cloud

The production of breeding sows is an activity dedicated to raising and reproducing sows with the purpose of obtaining litters of piglets and thus producing food with complementary or substitute characteristics to the concentrates, a process that includes sanitary and hygienic management is carried out to ensure the health of breeding sows. Based on Petrakovsky et al. (2013) establish that it is of great importance to follow up on disease control in order to prevent the affectations of the sowing procedure through the implementation of an integral Biosecurity process.

Therefore, it is of great importance to control diseases since this procedure is influenced by a bacterial disease called leptospirosis that significantly affects pregnant sows, losing their appetite, causing changes in the decrease of reproductive development, and even causing abortions. According to Tercilla and García (2005), this disease has a great impact on this sector due to frequent reproductive disorders such as abortions, infertility, the birth of weak offspring, mortality, and fetal mummification, among others, generating economic losses that reduce the profits of producers.

All the necessary procedures in production are carried out with the objective of seeking alternatives to improve feed efficiency, reduce production costs, and promote a sustainable and satisfactory
approach to achieve good results and generate gratifying profits for the producer as mentioned by Montesdeoca (2022), where mentions that the objective of a system is to achieve high productivity, ideally in the feed that is efficient and replaced by good, healthy, and organic percentages since the development of the sows depends on this and thus have very good daily weight gains and feed conversions, reaching maximum levels of efficiency**.**

Figure 1. Word cloud

Deductive analysis - network of families

The interviewees' accounts allowed for the identification of 53 codes of interest, which were grouped into three families of analysis as follows: economic, technical-productive, and pig farmer:

Technical-productive family

Pig production begins with breeding, which is an extensive process. The purpose of breeding is to combine parents with good genetic characteristics to improve the quality of the pigs in the production system; therefore, what is achieved is to increase the performance, in this case, of the sows. This perception of the interviewee coincides with that raised by Beltrán and López (2015), who assure that one of the benefits of genetic improvement is

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precisely to ensure and potentiate certain specific characteristics of the breeders.
It should be clarified that, even if there are good genetics, adequate management protocols should be implemented in terms of hygiene since incorrect management of cleanliness generates an environment conducive to the storage of pathogens that cause disease in the animals. According to Aherne (2002), 85 % of pig diseases are caused by inadequate feeding, hygiene, and management practices. For this reason, it is recommended to implement preventive rather than corrective measures.
The sows should be fattened, as they should weigh approximately 120 kilograms so that they can reproduce. Contrary to what the producer mentions, Trujillo et al. (2019), affirms that the weight that sows should have at the time of reproduction should be at least 140 kilograms; now, to reach the desired weight, concentrates are usually used, but feeding alternatives can be implemented that include a great diversity of foods and that help the transition process from conventional to alternative.
However, the decrease in the use of concentrates and the use of a greater diversity of feeds delay fattening, which extends the time to achieve the desired results (Figure 1). Contrary to the producer's perception, Arenas et al. (2014), assure that alternative feeds do not have an unfavorable effect in terms of weight gain since their experience in the use of bore in the fattening stage in pigs showed that.

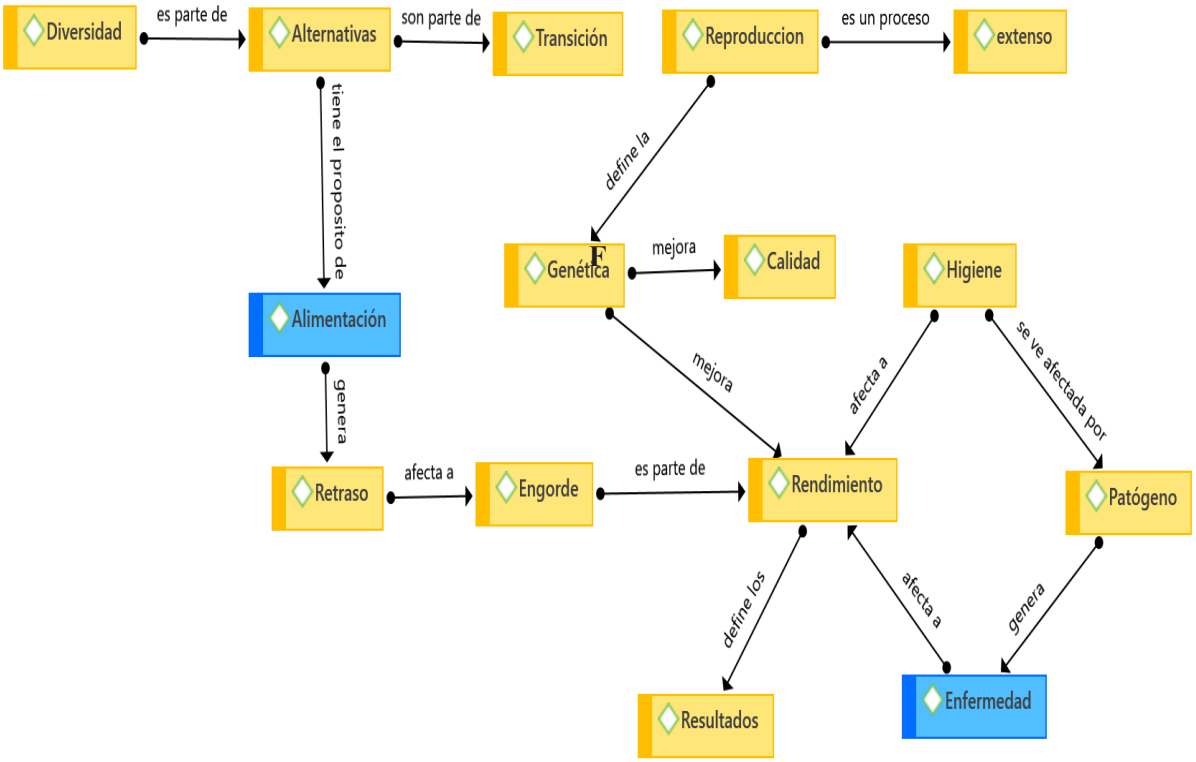

Figure 2. Technical-productive family

Family economy
Within sow production, marketing is linked to the market and the prices offered for the product. According to Guzmán (2018), there are two types of commercialization of live pigs: through traders and commission agents. In the case of traders, the price of the animal is not fixed. Therefore, the economic benefit is not fixed either since the trader is subject to market prices, which is why the interviewee's assessment is correct. In addition, the sale value of pigs is affected by inflation, which largely defines the economic dynamics of the markets.
All these dynamics define the profits and inputs to the production systems since depending on the price at which the weaned pigs are sold, profits or losses are defined at the time of marketing; apart from inflation, issues such as supply and demand also affect prices and therefore the profitability of the sale of breeding stock. Another important factor to take into account that greatly impacts profitability is production costs since minimizing the expense of feeding pigs helps to increase profits when selling them. This interviewee agrees with Ordaz (2020), who emphasizes that pig farming in several regions of the world faces economic constraints such as the constant change in the price of meat, the high cost of inputs, and, above all, pork imports, which greatly increase inflation and disadvantage local production.

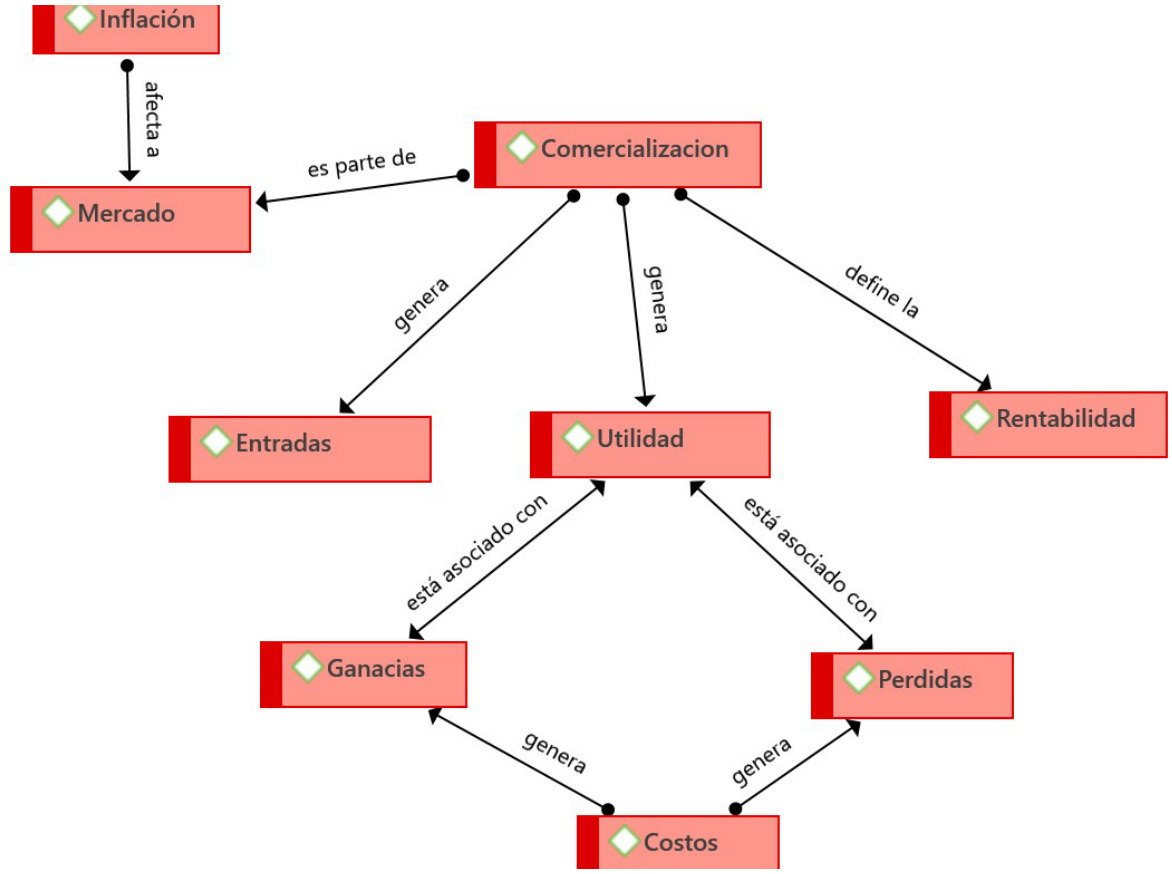

Figure 3. Family economy

Pig farmer family

Knowledge of good animal husbandry practices in sow production is essential to improve efficiency, ensure animal health and welfare, obtain quality offspring, increase profitability, and comply with regulations. Beyli et al. (2012), mention that it is of vital importance to adopt Good Animal Husbandry Practices. However, their implementation is optional, as market demands in terms of quality and food safety are becoming more and more demanding. Therefore, he agrees with the interviewee's statement.

For the producer, it is important to replicate his knowledge in order to motivate new producers to make a transition in their production systems so that they can enjoy all the benefits mentioned above.

For the good management of the production it is necessary a great dedication which implies to be present in all the stages of the process, from the selection of the reproducers to the commercialization of the pigs. As stated by Razas Porcinas (2022), one of the fundamental aspects that a pig farmer must have is the life or production phases of the sows since these define when the sows are ready for reproduction and how long this can be useful. Taking into account the above aspects, successful production can be achieved, which will generate satisfaction, an invaluable reward for the producer that will motivate him to encourage new producers through training programs and technical advice, providing updated information on innovative practices, genetic improvement, and efficient management techniques. According to Braun (2016), it is essential to provide services to a variety of actors, including producers of various scales and modalities, in order to support advisory and training activities in various ways.

Inductive (Sankey) analysis

The production of sows through a system different from the conventional one is intertwined with certain characteristics necessary to achieve the desired results; for this, the females must be in the right conditions, free of diseases, and with their ideal weight of 120 kilograms to carry out their farrowing stage. According to Porkcolombia (2020), gilts should be one year old for their first farrowing, which means that they should be covered in the third estrus, with a weight between 115 - 120 kg in traditional breeds and 120 - 130 kg for sows of hybrid lines.

The quality of the piglets depends on the genetics of the sows since certain breeds have better production characteristics and more actas for the maternal role, taking into account that by not having the characteristics of the sows present, the piglets can die before the time of farrowing and even be born before the stipulated period.

According to Garcia (2018), he highlights that throughout the reproductive stage it is important to carry out a good feeding since this is an important factor to be able to achieve the desired results in the shortest possible time. Feeding during this stage will then cover the production needs of the sow and will ensure a minimum body wasting, as well as an adequate subsequent reproductive performance; the nutrients acquired by the sow will be distributed for the maintenance of the sow in a (20 %), and milk production a (80 %), so the requirements are set based on the size of the litter and the consumption capacity of the females.

After parturition, a period of 3 to 5 weeks is taken into account for weaning the piglets, i.e., when the piglets are separated from their mother and begin their growth stage. According to Sangeado (2003), piglets can be weaned in "two ways," from two weeks (early weaning), to eight weeks of age (late weaning), taking into account that the average or normal time ranges from 35 to 42 days of age.

Figura 4. Familia porcicultor

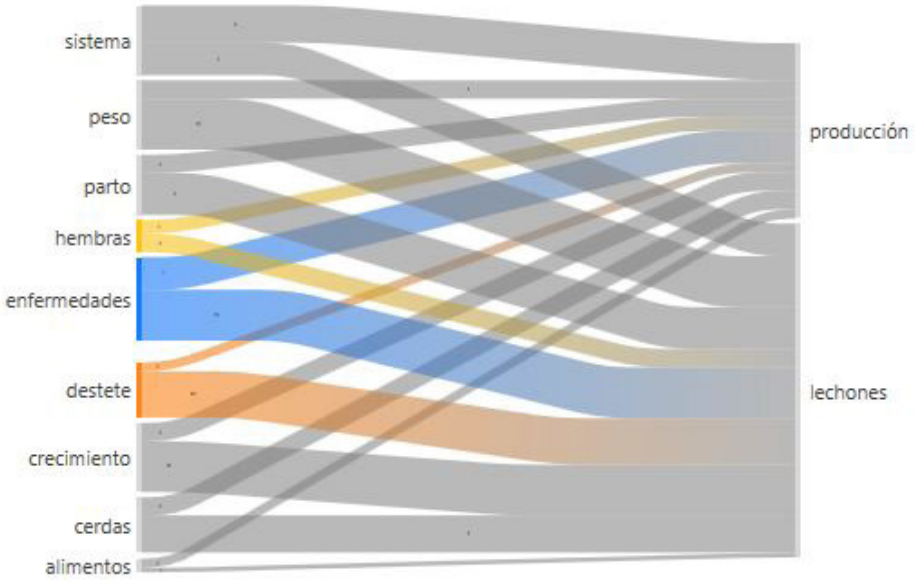

Figure 5. Sankey diagram

CONCLUSIONS

The process of producing breeding sows using alternative feed has proven to be beneficial and effective since the same yields are maintained. At the same time, environmental impact and production costs are reduced. Through the implementation of this approach, the following results have been obtained:

- Reduced production costs: the use of alternative feed has resulted in reduced production costs in the breeding process of breeding sows. The use of forage crops has resulted in a more economical option compared to commercial feeds. This has resulted in lower expenses related to sow feeding and has improved the profitability of the production system.
- Sustainability and reduced environmental impact: alternative feeding in the breeding process of breeding sows has contributed to sustainability and reduced environmental impact. By using locally grown ingredients, dependence on industrial products is decreased, and deforestation is reduced. This has a positive effect on the conservation of natural resources and mitigation of greenhouse gas emissions.
- The implementation of alternative feeding in the production process of breeding sows has proven to be an effective strategy to inspire and motivate different producers. Through these practices, it is shown that it is possible to improve productivity and animal health, reduce environmental impact, and, at the same time, achieve greater profitability.
- Importance of Good Farming Practices: knowledge and application of Good Farming Practices in sow production is essential to improve efficiency, ensure animal health and welfare, obtain quality offspring, increase profitability, and comply with regulations. This is due to increasingly stringent market demands in terms of quality and food safety.
- Motivation for new producers: Producers who have experience in implementing Good Animal Husbandry Practices must replicate their knowledge and motivate other producers to make a transition in their production systems. The benefits mentioned above, such as improved profitability and personal satisfaction, can be a valuable incentive for new producers.
- Commitment and dedication to production management: successful swine production management requires dedication and presence at all stages of the process, from the selection of breeding stock to the marketing of the pigs. The life or production phases of the sows are especially important, as they determine the right time for reproduction and the duration of their usefulness as breeders.
- Training and technical advisory services: it is essential to provide training and technical advisory services to producers to support their activities and provide them with up-to-date information on innovative practices, genetic improvement, and efficient management techniques. These services should be available to producers of different scales and modalities in order to meet the specific needs of each one.
- In summary, the implementation of Good Farming Practices in sow production is crucial for optimal results in terms of efficiency, animal health, offspring quality, and profitability. Producers with experience in these practices have a responsibility to share their knowledge and motivate others to adopt them. At the same time, training and technical advisory services play an important role in supporting producers and disseminating up-to-date information.

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CONFLICT OF INTEREST

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