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ECONOMIC BOOST IN SMALL MEAT AND MILK PRODUCERS THROUGH EFFECTIVE PRODUCTION RECORDS

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Abstract: The agricultural sector in most small producers in developing countries is considered a “way of life” rather than a business. Producers need to keep records to apply effective management strategies that improve the long-term profitability of their production unit in order to be seen as a business. Implementing records begins with the collection and organization of farm production (physical) and financial (revenue/expense) information. Historically, the usefulness, use and benefits of information for decision-making in agricultural companies have been underestimated by both researchers and those who implement public policy towards the sector. Data must be information that is transformed into meaningful and useful information for decision making, with an economic benefit. Livestock information systems (registries) can be considered a tool to help companies plan, manage and control risks through the use of information. The objective of this study is to raise awareness about the importance of implementing a record system in the production units of small producers, particularly meat and milk, since they provide an overview of the updated events of the production units, as well as knowing the limitations, estimate concepts such as necessary investments in the agricultural company.

Keywords: registration system, production, small producers, meat and milk

INTRODUCTION

The evolving economy sets global standards, therefore, it is essential for producers to update their administrative processes. In production units in developing countries, there is little use of production records, their implementation will leave behind a historical or so-called “traditional” production model in which agriculture plays a fundamental role and where its economy is

sustained. In the work of the producer and his family (Macias, 2013), knowledge is intuitive and empirical that small producers handle in a traditional way, a scheme with a business vision must be added in which decisions are based on the information that originates in the company and this in turn results in a constant flow data structure. In underdeveloped countries, small producers in the future will be the first to be affected and will increasingly seek employment opportunities outside the agricultural sector in the face of increasingly imminent globalization. This is causing an increase in migratory flows, especially of male members of rural households, which is leading, in turn, to the “feminization” of agriculture in many parts of the world and puts food security at risk in these countries (Angelo, M. J. (2017); the World Bank states that livestock companies that apply information technologies for company management increased five times more than those that do not apply it (Hodson de Jaramillo, et al. (2019)). The above indicates that the permanence of companies mainly in small producers can be sustainable if they have adequate technical training for the management of their processes. Among the possible reasons given for not using agricultural information systems are excessive work, lack of information to not use them and lack of time to dedicate to records, in addition to age, level of education, size of the farm, socioeconomic condition of the producer, membership in an association can be factors that limit its implementation. One of the limitations for this type of producers is currently the acquisition of information technology in agricultural activity; however, reducing this limitation can translate into economic benefits. In terms of economic value, the technological innovation that unites computing with the Internet is already part of a new production model that is based on very specific knowledge activities (Gołaś,

M., et al. 2020)). The above, combined with the development of nano and biotechnology, has a strong impact on economic activity and promotes the rethinking of processes that always promote productive efficiency (Albornoz, 2006). In Latin America, the important role of adopting computer services that promote the efficiency of productive sectors and thereby foster competitive situations at a local and global level that include added value of products has been discussed (Moguillansky, 2005). In developing countries, information technologies must be adopted and adapted that reduce risk and uncertainty in the management of food production of animal origin (Chávez, et al. 2019). Current economic trends require the adoption of these technologies by the livestock sector, since food safety is at stake, which implies that food is safe, and this way the health of the end user is guaranteed by applying traceability concepts to This requires developing administrative skills related to a records system; To do this, the available technology in terms of computer programs must be considered, and connectivity must be promoted in rural regions where it does not exist; In addition, the use of Geographic Information Systems (GIS) or GIS for its acronym in English that uses spatial information for adequate knowledge of the surface of agricultural companies and thus optimize its use, in terms of herds, readers can be used. radio frequency with control units (Rodrigo, C. 2022). All of the above, available now, must be gradually adapted to the way of production of small and medium-sized agricultural companies and this way guarantee their sustainability.

WHAT ARE PRODUCTION RECORDS?

Production records are a primary and necessary administrative element to provide specific and understandable information

about companies, particularly agricultural ones. They provide a summary of the necessary information with all the processes that occur in them. Documenting activities provides a knowledge structure that determines the progressive development of production units. However, despite their relevance, the majority of small producers are not aware of them, which represents a competitive disadvantage (Vélez, J. 2022). The objective of maintaining a record system is to provide an updated overview of the events of the production units, as well as to know the limitations, estimate concepts such as necessary investments in the agricultural company. Production records are elements related to the quantities of inputs and production levels by company and/or by type of resource. They consist of crop yields, sowing calendars, calves born, kilos of milk produced, weaning weights, losses due to death, reproduction, etc.; (Martín, 2022). Both production and financial records are important for the effective management of today's agricultural businesses and, used together, provide valuable information on the viability of a farm. In developed countries, if you are a business owner, you will have to provide information about your business to a number of bodies, such as your banks, or state and municipal tax departments. You will also need good financial records if you are considering purchasing crop insurance or other federally subsidized risk management products. Finally, in the event of a disaster you will be required to submit previous records in order to participate in many state or federal emergency programs (Paschek et al., 2018). Production records also become valuable when they become an indispensable tool in decision-making, mainly of an economic nature. They also allow the identification of many of the processes related to livestock and thus meet the requirements of the local and global market. In addition to being able

to select the most productive animals and their progeny for replacement and supply the appropriate amount of food for their performance, they also make it possible to discard those animals that affect the profitability of the company and implement continuous improvement strategies (Rodríguez, 2021). The recommendation is to adopt and adapt a records system that provides accurate knowledge of the events that take place in the production unit. For the above, there are different ways to do it from the so-called “field sheets” that are paper, or spreadsheets or specialized software (Molina, et al., 2019). Keeping adequate documentation of events allows for adequate management of agricultural companies; this process must become part of the routine that every producer must do.

SOURCE OF DATA FROM PRODUCTION RECORDS SYSTEMS

PRIMARY INFORMATION:

The production unit provides data over time, the idea is that these have been collected in a precise way, if not, only the experience and knowledge of the producer or workers who have had some significant time working in the unit would be counted. In addition to this, a diagnosis of the characteristics of the production unit must be made (Escareño et al., 2009). Marginal producers do not have production records, therefore, there is no complete idea of how to improve their production process. In developed countries there are entities designated by the State whose job is to collect this information, this must be established definitively, and it is important that local entities invest resources in this task. It is hoped that the producer could keep their own production records, however, this is practically impossible because there is

no adequate sensitivity and training for them to carry out this process in a detailed manner. A detailed registration procedure may not be practical and producers need to observe short-term benefits to be able to implement them as well as the necessary support from professionals on the subject. Registration systems for meat production are more convenient due to the repeated measurements that this implies, unlike milk production. It is therefore important to identify data that is easy to measure and that is proportionally related to production characteristics (Ifiiguez, et al., 2009). The producer’s activities must not be saturated, they prioritize their activities according to personal and historical criteria and in that sense they could become aware of the benefits of keeping productive records.

SECONDARY INFORMATION

This type of information is collected from neighboring production units that are comparable at the time, as well as statistics from regional studies carried out by local entities and review regional production parameters. Thus the information obtained will be direct, in addition to the use of complementary techniques such as observation and diagnosis of production units, it is then where this information can be compared with that provided by public entities, as well as companies in the region and other related studies. (Quispe, et al., 2009).

WHAT DATA TO RECORD?

According to García (2017), the events for registration depend on the production units, and the interests of the producers in particular, the records must include all those production processes that include parameters of interest and that are objective, measurable, realistic., and that, if improved, they have a certain degree of achievable difficulty. In livestock companies it is necessary to

start by identifying the animals and then move towards productive and reproductive indicators, as well as those related to food, among many others. The animal count must include all information that specifically provides the characteristics of productive importance or that complements it, starting with the identification of the animal, followed by characteristics such as: breed, age, sex, coat color, etc. others (García J., 2017). According to the above, it is necessary to be specific in reproductive and production events; these events must provide useful information individually and for the herd, which leads to decisions regarding the life of an animal within the company. When implementing the records system, it is also important to evaluate it with a certain degree of periodicity, so that areas of opportunity can be identified and at the time decide on the future of the company's activities in a timely manner. The documented events of the company are of great value even to define a planning of the different processes to be carried out throughout the entire production cycle and to estimate economic indicators in different periods of time, such as: income statement, profitability and their possible comparisons of what was estimated and executed and at a given time model that information (Lam, 2018), these data are detailed later in this document.

REGISTRATION METHODS

There are various ways to carry out productive records in an agricultural company, which are described below.

1. Notebooks.
2. Individual field sheets.
3. Spreadsheets.
4. Records Programs.

It is necessary to consider that when implementing a registration system it is as friendly as possible for the producer, it must

also have all the necessary information that is in accordance with the company's objectives, specific and reliable since erroneous data would directly affect the producer.

Below is a summary of the most important records in the livestock company (figure 1), however, as mentioned above, the record system must preferably be adapted to the livestock production unit, where it is necessary to know the productive objective. (meat, milk or both), and thereby design the formats that contain the information to be collected within the company (Moreno and Arroyave, 2019).

PLAYBACK AND PRODUCTION RECORDS:

This type of record is basic, which allows the analysis of the productive performance of the livestock inventory. The ideal is to have individual records and this way extrapolate it to the herd. They also allow us to analyze the historical behavior of livestock and thus implement the best reproductive techniques that include artificial insemination, as well as knowing the physiological state of females and males (Franco, 2018); These records include information such as: birth dates, to track lactation individually and to take a closer look at animals if they change suddenly and unexpectedly, as well as daily milk production per herd, verify milk payments and adjust feeding. Data on the composition of the milk preferably in the production unit or, where appropriate, in the collection companies, to monitor the effects of feeding. Constant control of the diet (concentrates and forages) and what is actually consumed can give clues whether the cows are in the reproductive stage or subclinically ill. Weight and body condition of adult cows to monitor milk production during lactation and optimally plan feeding.

HEALTH RECORDS

These include individual health management, in addition to the treatment of mastitis in dairy cattle, which is a common pathology, and other types of treatments that require that milk not be destined for the market. It is always necessary to follow product retention protocols during the treatment period to ensure that their quality is not affected.

Record type	Specifications
Reproduction	Heat, direct mating or artificial insemination, pregnancy percentage, birth percentage
Births	Birth and weaning weight
Production	Liters of milk per day or daily weight gain
Sanitary	Vaccinations, deworming
Food	Grazing and supplementation
Live weight	For sale
Purchasing animals	
Dead animals	Mortality percentage
Economic indicators	Prices, income, expenses, among others

Figure 1: Main records to consider within the agricultural company

Source: self made

The essence of the events to be recorded lies in being efficient from an economic perspective, selecting the animals with the characteristics that the producer chooses according to the production objectives, as well as their progeny, as well as the animals destined for replacement and discarding. of those who do not fit the selection pressure. However, the essence of the beginning of the compilation of information is unknown to the producers and the advantages that result from its analysis to achieve the proposed parameters or objectives of the company. The producer must become an efficient businessman, the production process must be within reach of the products that impact him economically. For which it

is necessary to initiate it to allow such results to be measured and this way to carry out the necessary analysis with the objectives that are previously set and thus correct any changes and carry out the necessary adjustment in productive planning.

FINANCIAL AND ADMINISTRATIVE RECORDS

This type of records includes investments, expenses, income and capital increases; they include sales for a certain period of time of the company's products and by-products (Ventura and Delgado, 2015). These records allow us to know the total tangible capital of the company, and allow us to control the expenses and income of the production unit, which allows us to analyze the company's income statement of both profits and losses, which is interpreted as The company's financial stability details of this information flow are shown in Figure 2.



Figure 2. Information management model of an agricultural company

Source: Own elaboration with data from: Vanderlin (2021)

Every record system must begin with the inventory of the production unit. Understand the inclusion of everything related to physical infrastructure, equipment and livestock. This will allow you to calculate depreciation and perform economic calculations; To carry out this inventory, a distinction must be made between land area, crops, and inputs, all of

the above with the necessary specifications that allow them to be evaluated. Once the company's assets are classified, the adjustment to the local environment is made, and its valuation must be calculated over the years, the value of the inventory constitutes the total value of the unit and is part of the general balance. Once the above is done, value must be added according to the different criteria that exist in economic theory such as: net present value, production costs, added value, among others. The inventory is therefore of utmost importance and must be carried out annually, thus allowing comparison with previous years; according to the result, the relevant strategies will be taken for its adaptation (Carro, and González, 2013).

FIXED ASSET

This item corresponds to the permanent and semi-permanent assets of the company. The value of the land surface is included, as well as assets subject to depreciation. Examples of these are land and rangelands, permanent crops, infrastructure, equipment and machinery, as well as animals used for reproductive purposes (Valdés, 1970). The records must be specific about the assets that are acquired, and include the dates in all aspects; it is also necessary to calculate their useful lives, as well as their annual and accumulated depreciation, and their current value. In addition to the above, all inputs and products that exist in the company must be recorded, including trade names, and their quantity at the beginning or end of the processes, as well as their total and unit value.

CURRENT ASSETS

It consists of those goods that are consumed or can be sold within a period of one to two years. It includes animals for non-reproductive purposes, warehouse inputs, or annual or biannual short-cycle crops.

NET ASSETS

It is constituted by cash, or what is in the bank, in the so-called "petty cash" or accounts receivable in the short term, in such a way that this allows knowing the financial statements with which the profit and loss statement and balance sheet. Within the financial records to consider daily are expenses and income, detailing the amounts is important as well as the concepts, income represents the "gross" value of production, it includes the sale of capital goods, services or any other income of capital that enters the company. Unlike expenses that include operating costs, or so-called capitalizable expenses, in addition to administration costs. The sizes of companies vary and grow, in that sense the costs will have to increase by what, therefore detailing these costs is fully justifiable.

OPERATING EXPENSES:

Salaries, social benefits, bonuses and food are included in this item, in addition to eventual labor, also equipment and machinery, fuel, repairs and spare parts of the equipment. Some companies rent equipment and machinery that is included in this section, in addition to all inputs related to agricultural activity. The health of the animals and all the inputs to achieve it, in addition to veterinary services, also have a cost that must be considered in this area. Accounting services, travel expenses, association fees with producers, and interest on loans must also be recorded.

CAPITALIZABLE EXPENSES

Animals, equipment and machinery, physical infrastructure and land area fall into this category. At the end of the accounting activity, the information must be analyzed to determine profits and losses, as well as all indicators of productivity and profitability, budget control, break-even point, production

to cover costs, as well as ceiling prices.

USE, ANALYSIS AND INTERPRETATION OF RECORDS:

When the records system is implemented, the above must be analyzed frequently, in order to detect movements and decide on them in a timely manner and with them a strategic planning can be developed, which is a documented process that brings together the objectives of the organization. and the actions necessary to achieve them. It also includes an evaluation in order to visualize the situation the company is in and the opportunities it has to achieve success (Matute and Reyes, 2022). The characteristics of the agricultural company influence the implementation of the type of records system, however, this system must be designed in the simplest possible way since its updating and thus making the data useful depends on it. During the production process, the person designated to collect the information must be trained, which in turn must be planned so that all production and reproduction events within the company are captured. It must also be made clear that with this activity achieve a precise analysis of the

current state of the agricultural company and thus be able to improve processes.

CONCLUSIONS AND CONSIDERATIONS

The quality and quantity of information that is generated in the production units cannot be kept in the producer's memory, therefore, it is necessary that all events that occur in it be recorded. In all stages of the administrative process, information is useful to decide on the processes to follow in a sustainable manner. The detail of the data has a certain degree of difficulty, which is why it is also necessary that there be trained personnel to collect the information that feeds it. For this, its practice must be promoted and disseminated. The above is of utmost importance since this will even allow modeling economic conditions to achieve optimization of available resources. In the record-keeping process, it may be necessary to involve government agencies to decide how to implement the production records system that is appropriate to the type of producer and that the information generated is useful to manage all processes. administrative type that are carried out outside the production units.

REFERENCES

- Albornoz, I. (2006). Software para el sector agropecuario. *Littec, Buenos Aires*.
- Angelo, M. J. (2017). La seguridad alimentaria, la agricultura industrializada y un cambio climático mundial: Perspectivas en Estados Unidos y Cuba. *Florida Journal of International Law, 29*(1), 38.
- Carro, R., & González Gómez, D. A. (2013). Logística empresarial.
- Chávez, A. G., Molina, O. A. M., & Delgado, J. L. C. (2019). El conectivismo y las TIC: Un paradigma que impacta el proceso enseñanza aprendizaje. *Revista Cientific, 4*(14), 205-227.
- Escareño Sánchez, L. M., Wurzinger, M., Pastor López, F., Salinas, H., Sölkner, J., & Iñiguez, L. (2011). La cabra y los sistemas de producción caprina de los pequeños productores de la Comarca Lagunera, en el norte de México. *Revista Chapingo serie ciencias forestales y del ambiente, 17*(SPE), 235-246.
- Franco López, J. D. (2018). Perspectiva financiera de los activos biológicos en la producción de leche.
- García Guiliany, J. E., Duran, S. E., Cardeño Pórtela, E., Prieto Pulido, R., García Cali, E., & Paz Marcano, A. (2017). Proceso de planificación estratégica: Etapas ejecutadas en pequeñas y medianas empresas para optimizar la competitividad.

- Gołaś, M., Sulewski, P., Wąs, A., Kłoczko-Gajewska, A., & Pogodzińska, K. (2020). On the way to sustainable agriculture—eco-efficiency of polish commercial farms. *Agriculture*, 10(10), 438.
- Hodson de Jaramillo, E., Trigo, E., Henry, G., Aramendis Ramírez, R. H., Castaño, A., Coremberg, A., ... & Otero, M. (2019). *La bioeconomía. Nuevo marco para el crecimiento sostenible en América Latina: Bioeconomy. New framework for sustainable growth in Latin America*. Editorial Pontificia Universidad Javeriana.
- Iñiguez Rojas, L., Mueller, J. P., Facó, O., Wurzinger, M., Sölkner, J., Rodríguez, T., & Salinas González, H. (2013). Limitaciones y sostenibilidad del mejoramiento genético comunitario para pequeños productores en las zonas Áridas de Latinoamérica.
- Lam González, J. A. (2018). Integración del riesgo en la estimación del Valor Ganado para la gerencia del costo de un proyecto de construcción.
- Macías, A. M. (2013). Introducción. Los pequeños productores agrícolas en México. *Carta económica regional*, (111), 7-18.
- Martín, J. M. D. (2022). Proyecto de producción en extensivo de ganado vacuno, para la producción de terneros pasteros en una finca de 386 ha, en la Finca La Raña de Valdeazores, término municipal de Los Navalucillos (Toledo).
- Matute Tapia, E. G., & Reyes Espinoza, P. F. (2022). *La planificación estratégica de las PYMES del sector manufacturero de alimentos en Cuenca, análisis y diseño de estrategias para la recuperación post pandemia* (Bachelor's thesis).
- Moguillansky, G. (2005). *La importancia de la tecnología de la información y la comunicación para las industrias de recursos naturales*. CEPAL.
- Molina Corral, L. A., Piñón Howlet, L. C., Sapién Aguilar, A. L., & Gallegos Cereceres, V. M. (2019). Análisis de las Habilidades Administrativas y de Gestión en las Micro y Pequeñas Empresas de la ciudad de Chihuahua. *Nova scientia*, 11(22), 293-322.
- Moreno, T. A. P., & Arroyave, M. R. M. (2019). La incidencia de los registros en la producción de ganado bovino y su importancia para conocer su rentabilidad a lo largo de un ciclo productivo. *Revista Científica Ciencia y Tecnología*, 19(23).
- Paschek, D., Ivascu, L., & Draghici, A. (2018). Knowledge management—the foundation for a successful business process management. *Procedia-Social and Behavioral Sciences*, 238, 182-191.
- Quispe, E. C., Rodríguez, T. C., Iñiguez, L. R., & Mueller, J. P. (2009). Producción de fibra de alpaca, llama, vicuña y guanaco en Sudamérica. *Animal Genetic Resources/Recursos génétiques animales/Recursos genéticos animales*, 45, 1-14.
- Rodríguez Farfán, F. R. A. N. C. Y. (2021). *Implementación Y Aprovechamiento De Registros De Producción De Polen En La Empresa Apícola* (Doctoral dissertation).
- Rodrigo, C. P. A. (2022). sistema de identificación y control del ganado vacuno mediante receptores nfc en la hacienda rancho felia (Doctoral dissertation, Universidad Agraria del Ecuador).
- Valdes, E. M. (1970). *Determinacion Del Momento Optimo Economico en la Renovacion de Cultivos Semi-permanentes. El Caso de la Cana de Azucar*. Bib. Orton IICA/CATIE
- Vanderlin, Jenny (2021). Collecting and Organizing Records (Recopilación y organización de registros) (2021), redactado por, UW Center for Dairy Profitability y Katie Wantoch, UW-Madison, Division of Extension; revisado por Kevin Bernhardt, UW Center for Dairy Profitability/UW-Platteville.
- Vélez, J. C. C. (2022). Impacto de las telecomunicaciones en el desarrollo productivo del agro en la región Chone-Manabí. *Revista Tecnológica Ciencia y Educación Edwards Deming*, 6(1).
- Ventura Suárez, L. M., & Delgado Ángeles, G. M. (2015). Presupuesto de capital como herramienta de inversión para empresas en el sector agrícola.
- <https://farms.extension.wisc.edu/articles/collecting-and-organizing-records/> acceso 14 de julio de 2023.