Monitoreo de la producción animal MPA

Animal Production Monitoring MPA

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Resumen

La ganadería es una actividad económica dedicada a la crianza del conjunto de especies animales para sacar provecho al animal y sus productos derivados, así como la propia explotación del ganado. Tiene como objetivo la producción de animales para obtener carne y derivados. La ganadería bovina, porcina y ovina, está íntimamente relacionada con la agricultura, y estas dos actividades humanas dependen de un tipo especial de medio ambiente, que es el medio rural o agro ecosistema. El monitoreo de la producción animal (MPA), es un proyecto de software desarrollado con el alcance de cubrir con las necesidades de la región de la sierra alta del estado de Hidalgo muy cercano al municipio de Molango de Escamilla, Hgo., en carretera Molango–Atezca km. 25.

El objetivo principal de este estudio, es apoyar a los ganaderos regionales que necesitan aprovechar los recursos obtenidos a su mayor capacidad, administrando tres tipos de ganados diferentes: bovinos, ovinos y porcinos, desde un mismo sistema de información. Así, el software está enfocado al registro de datos que se maneja en la ganadería.

Palabras clave: monitoreo, ganadería, sistema, agropecuario.

Abstract

Farming is an economic activity devoted to raising all animal species to take advantage to the animal and its by-products, as well as livestock exploitation. It has as objective the production of animals for meat and derivatives. The cattle, swine and sheep, is intimately related to agriculture, and these two human activities depend on a special type of environment, which is the rural or agro ecosystem. Animal Production Monitoring (MPA), is a software project developed with the scope fulfill the needs of the region of Hidalgo state

high mountain range, very close to the municipality of Molango de Escamilla, Hgo., Molango-Azteca road km. 25.

The main objective of this study is to help regional farmers who need to leverage the resources obtained to its larger capacity, managing three types of different livestock: cattle, sheep and swine, from a single information system. Thus, the software is focused on data handling in livestock raising.

Key Words: monitoring, farming system, agricultural.

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Introduction

Background Farming is an economic activity dedicated to the breeding of animal species to take advantage of its meat and its by-products. The cattle, swine and sheep, is intimately related to agriculture, both human activities that are carried out in the rural or agricultural ecosystem. [1] Livestock can be classified into major and minor. Mayor: bovine, equine, bottlenose and donkeys. Minor: sheep, goats, pigs, bees, rabbits, camels, farm animals such as chickens, ducks, geese and piliferous like the chinchilla, otter and fox. Traditionally livestock raising is considered an Agriculture complement. Animal husbandry develops practically worldwide. There are three main types of livestock: nomadic grazing, ranching and intensive farming. Nomadism: currently, nomadic grazing remains the mode of subsistence of some marginal people. It involves movement of the family or groups of humans with animals from one place to another. Ranching: own large farms where livestock has access to land extensions, feeding mainly on natural pastures. It requires little capital investment for the farm, labor and food for livestock. Its main advantage is the respect for the environment and its major disadvantage is the low productivity.

Figura 1.Ganadería extensiva

Factory farming: its feature is the little exchange of products abroad, per head and per hectare yield is low, with low application of techniques. The agricultural space with socio-economic deficiency is underutilized because it requires large tracts of land.

APPROACH OF THE PROBLEM

Livestock, as all economic activity, is a way of generating income for those who exercise it. Its huge development in recent years has been growing, becoming one of the main activities of the field. In general, different farmers practicing this activity seeking an increase in production at the same time seeking a decrease in the loss mismanagement, due mainly to a lack of evaluation data on livestock. In the growing technology and business of agriculture modernization, economic activity tends to be organized in the form of modern enterprises, in the context of integration with agribusiness and dependent on the other hand, the progressive and growing impoverishment of those groups is found the population directly linked to traditional agricultural production. The lack of knowledge about registration activities on the part of those engaged in farming, involves losses have no knowledge of the status that is their livestock. When a farmer or livestock manager has knowledge, whether few or advanced on the records that allow you to control the production that attempts to make, they are rarely applied correctly and / or accurate.

Since the last decades it has sought to strengthen the livestock sector technologically worldwide. Different livestock companies have requested the implementation of computer systems to enable the organization of the data collected. In 1995 he published an article in the monthly magazine "Mundo Ganadero" by Manuel José Pérez Hernández:

"A computer system applied to a livestock business will allow to know what has happened in the past, we must plan and carry out day to day, which theoretically can be expected in the future. It is normal in many farms after implementing a computer system more than 20% efficiency is achieved ".

Therein lies the biggest reason for the update on the use of technology by farmers who want to be more competitive in the market.

However, in contrast to what should be done to increase production in the state and the region hardly use information systems for data management it is adopted. The main factor

is the lack of practice and use of computing resources. If we talk about people who are engaged in farming in the state, we find that about 50% over the activities performed without an organized management of production data such as production of breeding or reproduction, the sale of products and byproducts, the sale of animals or the casualties occur during the year and their causes. The lack of knowledge and lack of custom data analysis requires us to design and implement a software easy to understand and use, with the livestock-technology familiarization starts. The great mission will take the first step to allow technological development in the regional livestock for further prosperity, performance and competitiveness.

Methodology

The proposed system, once completed, could be implemented and improved essential characteristic to be taken into account. Therefore, the models studied and analyzed (Waterfall, Model V, iterative model, incremental development model, spiral model, model prototypes), it was decided that the ideal planning software model is the model incremental cycle life. This model consists of four stages, namely:

Analysis: the study of customer needs, research, gathering information on data within the information system.

Design: This step is performed by the logical design of the software, starting with the fundamental design, use case showing livestock activities. Entity-relationship diagrams proposed model database that stores information to monitor.

Encryption: is the essence of software, as in coding the activities or actions to take are reflected. With the code it tells the software what time removal, insertion and other actions related to the database is done.

Maintenance during maintenance corrections, implementations and improvements are made. Since the proposed model is incremental, these activities are performed over and over again during the life of the program. We must make special mention of the future research. After the end of this first stage of the project implementations for the maintenance, including improvements in the system database and applied technology they are made. As a fundamental point in the applied technology is the use of mobile devices for data collection and access to information from different points, perhaps in its most remote.

This is where it makes sense to use the iterative method for the development and implementation of software.

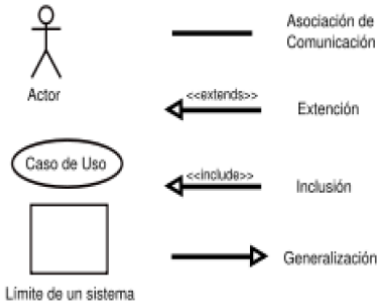

Figure 3. Elements in use case model

Experimental investigation

Then the process carried out to implement the MPA software, regarding the "Monitoring of Animal Production" project is described. The research process and coding is described in terms of the methodology, ie concerning proposed by Harlan Mills in 1980. Let's start with the first stage of the model incremental model.

Incremental development model (analysis)

The idea of developing MP is based on the idea proposed by Dr. Santiago San Roman Soto at the end of 2011 (livestock in the region of the High Sierra of Hidalgo), which was, at that time, in the implementation of a software that would allow the easy registration of livestock animals have. The model proposed eliminating the divisor known, Bovine Meat, Milk Cattle, etc., and manage both in one information system. The idea was revived on January 7, 2013, when the preliminary stage of the investigation begins. Subsequently the system design, the database and the first (the most basic and elemental) of MPA version was generated. The software monitoring of animal production aims to create a good opportunity to increase the monetary income of the livestock sector as economic activity. However, every good project starts with good research, which took place at the premises of CBTa and No.6 in the Technological University of the Sierra Hidalgo (UTSH). He was assisted staff in the livestock and agricultural sectors, trained to provide the information required for this research. In addition, field research was developed with the attachment and documents with important aspects of bovine swine, sheep and cattle. This allows us to have a vision about this research project, broader set goals, improve the functionality of the project, and so on.

Field research

As an introduction to livestock farming activities carried out and how they are made are considered. Therefore, at this stage the following data were collected:

- Cattle handled on campus (usually, in most of the state), it is mainly divided in cattle, sheep and pigs.
- Due to the limited amount that is administered in places like this institution, it is not feasible to group cattle in complex groups such as cattle meat, cattle milk or the like. A group of animals in general are driving, to seek the greatest possible benefit in one or other area as required. Both cattle, sheep and pigs developed mostly (about 95%) a major role, which is to "player". Once this role, the farmer determines whether it has to fulfill another function; in the case of cattle, dairy product can provide and its derivatives, while serving as breeding. When you have reached the final stage of an animal and can not give more, it is sent to trace (ie, is put on sale on the market for human consumption). This is done directly with the males, while females are sometimes used to practice methods which will help to improve farm practices as palpation, artificial insemination, and so on. Once this stage, you are also sent to the slaughterhouse. This is proof that small farms can not waste anything, and our mission is to design and adapt a system that works to benefit this area.
- Livestock is not at all a recreational activity, but serious business which depends on the power of millions of people worldwide; Moreover, it is a commercial activity that generates the livelihood of entire families. For all this, these projects should be taken with the utmost seriousness.

It is noteworthy that within the institution not directly linked information systems are handled with a database. However, some other identifications of the animals are captured to keep a monthly record, but these are few and generally basic. Initially, the information gathered was not enough, so we proceeded to supplement it with additional research. Our main sources were handbooks and articles on livestock and farmers interested in the subject willing to provide alternate information. Since little information could be obtained during our stay in the livestock sector, it was decided to investigate other sources. The results obtained are shown.

Data on the facts and events that are generated along the productive and commercial processes were recorded: for example, forms, spreadsheets, notebooks, software, and so on. Because human memory can hardly hold the amount of data needed to determine reliably measurable indicators, it is considered critical use of historical records or records of initial information.

Figure 4. Model of the information system

The records implement depend on what is required to control or measure. The data listed in the following records are basic to obtain the main indicators in the control of management of production and economic dedicated to the production of piglets and fattening animals aspects establishments.

High and low registers of players: identification, date, age and origin of the animals entering the system as players; dates and causes low when they leave that role.

Service records, birth and weaning: Event date; identifying players involved; type of service; pregnancy controls; farrowed piglets alive and dead.

Registration of death: dates, numbers of animals, categories, causes and diagnostic agent.

Other records: in addition to the records can take inventory of assets and liabilities, financial flows, stocks and food movements in factories and warehousing tasks or activities of the persons responsible, biosecurity controls and others considered of importance to monitor other areas or aspects of the production unit.

The economic and commercial activity management, analyzing indicators such as economic value of what is produced, overall production costs and composition of costs, profit margin, profit margin ratio / costs, volumes, values, dates, origins and shopping destinations and sales of inputs and outputs.

One of the most difficult to implement control systems in swine facilities management tasks is to achieve a sustainable use of data records. To achieve this goal it is suggested:

1. Design registration systems that meet the goals and needs of each particular situation. Check enabling it to gather the necessary data to obtain the information required.

2. Observe the records that are already being used, the organizational form of production units, responsibilities and capabilities of its members, the degree of motivation and collaboration you have.
3. Remember that the records are only places where data are based. They not necessarily have to be forms: they may, for example, notebooks, software or recordings. The better registration system is best gather data.
4. Use procedures for removing the data recorded without moving your spreadsheets or notebooks wherever they are permanently collected; eg duplication with carbon paper or photocopies.
5. Try the operational task that involves data entry is performed by employees or family members. It should not be the main task of technicians and managers of the enterprise, who must book this time to ensure the analysis of results.
6. To implement a strategic plan for extraction of information, monitor it on an ongoing basis and take corrective action.

For the data collected in field recordings are really useful these must become strategic information available when the heads of the production units require. Such information must transcend the anecdotal and provide a basis for improved decision-making processes.

Categorías	Existencia inicial	Entradas	Salidas	Cambios categorías		Muertes	Existencia final
				suman	restan		
Post destete	9	64	1		8		64
Recría 1	40			8	38		10
Recría 2	33			38	25	1	45
Terminación 1	48			25	40		33
Terminación 2	11		11	40			40
TOTAL	141	64	12	111	111	1	192

Fuente: Centro de Información de Actividades Porcina CIAP

Figura 5. Registros en una organización ganadera

Results

It is not enough to collect field data stored in spreadsheets or software and have reports with measurement indicators. To successfully implement a true control system is necessary to analyze the results, to recognize deviations and develop corrective measures. To improve the analysis of the results it is recommended to confront results, broaden the information base, identifying positive and negative aspects of management, the causes that originated them and the consequences that would not modify the existing plan. To recognize if the values of certain indicators are appropriate necessary comparisons. The main benchmark to consider when evaluating the operation of the production unit must be planned objective.

When results are away from the established goals, with better values or worse than expected, they may identify aspects that justify modifying existing plans.

The results achieved in the production unit itself in earlier periods and other facilities are also excellent measures for comparison and for assessing the performance of the business and its relative situation. When these results are used should take into account the type of production system, the size and conditions of particular contexts in which they were achieved.

From the analysis of results should identify the current situations that prevent achieving objectives and their causal factors, a basis for developing corrective measures. These factors can be endogenous and exogenous with respect to the decisions of managers. Endogenous, which can be modified by administrators, are the central focus of evaluation. Furthermore, exogenous, outside their control, are the environmental conditions or political, social and economic situations. From this framework, we analyze how to achieve the required changes in endogenous factors and take advantage of better conditions of each context. For the system of monitoring the maximum benefit, the data must be transformed into useful information at the time it is needed, so it is only relevant and necessary data handling. For the system of monitoring the maximum benefit, the data must be transformed into useful information. It is very frustrating analyze data from situations in which there is no ability to influence, so it is recommended to ensure daily, weekly, biweekly or monthly meetings where those responsible for the administration and its technical consultants analyze the management of the activity and replanifiquen your developing.

The use case model represents activities or use cases that the user or application administrator, who is engaged to enter the database information related to cattle should perform. This diagram consists of four use cases, which are enclosed by ovals on the left, to the right of the actor. The actor of this model represents the bovine livestock. The arrows linking the actor to the use cases represent an association of communication.

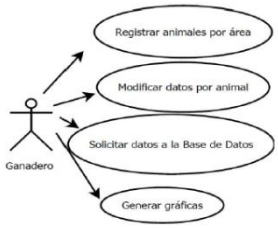

Figure 6. Use Case Model Information System

Reports generated have the facility to be saved as a file in PDF or DOC format, saving paper and space in physical files, whereas the farmer want a backup. You can also directly print the file. This will ultimately be according to the needs of auto-access to required information.

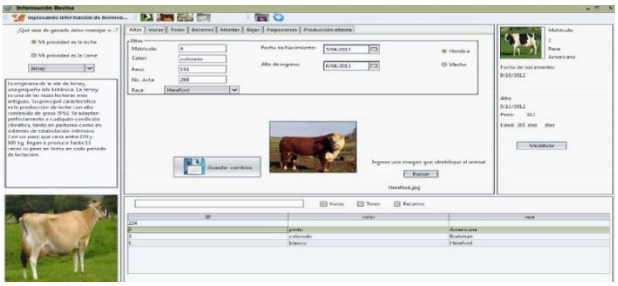

Figure 7. Self-access interface

The evidence that the information can be recovered and analyzed, was found in the following reports that can display and interpret the livestock. Even without knowledge of livestock, it is very easy to understand what is expressed in them. Therefore, this information can be verified by anyone who belongs to an association or group or livestock.

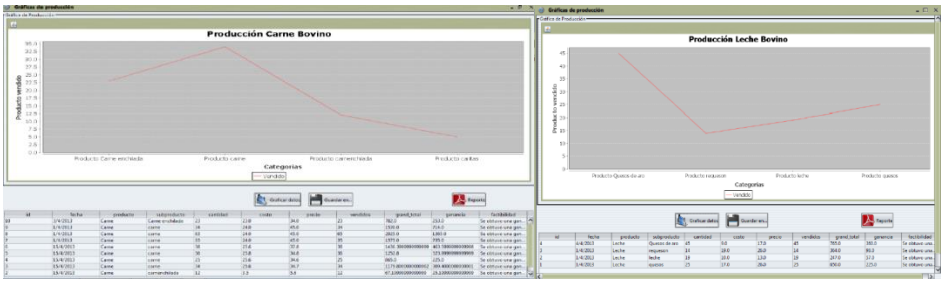

Figure 8. Production of meats

The information in the figure above shows how relevant statistical content for decision making. It took some real data of livestock entity.

The figure below shows the reports on the production in beef sales. The same type of report can be made for the sale of milk and skins. For each type of livestock reporting a different model is used, which helps to keep them in the style according to the required information.

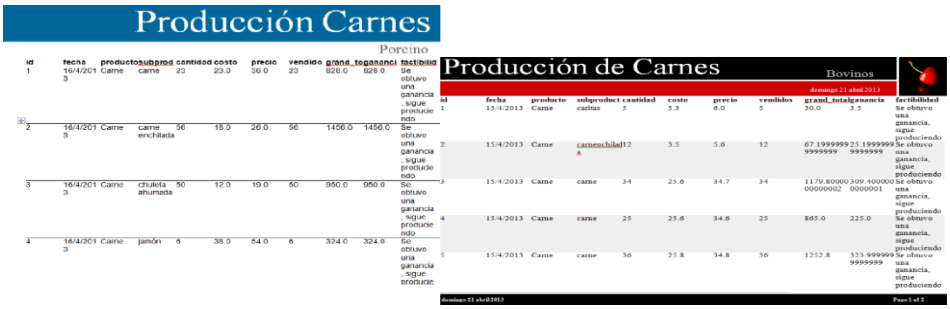

Figure 9. Production of meat

CONCLUSION

Apply modern technology to livestock, it allows this grow and become more competitive as an economic activity. The adoption and implementation of management systems allows farmers to stay on the same level as its main competitors. In a farm is required analysis of all the information generated in the interior, as well as all those from the outside in order to realize good governance. It is increasingly common to associate the management of any business computing, which in this case may bring many benefits to the farmer, the main support you in your decision making.

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