



Application of a model of management by macroprocesses to a beef cattle enterprise: a case study

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ABSTRACT - This is a case study that aimed at proposing a management method based on macroprocesses to determine and achieve strategic goals for a beef cattle enterprise in order to maintain or to increase the company's competitiveness. The method suggests using a series of tools mentioned in the literature that were organized providing logical reasons for the managers to build the management system. When mapping the processes of the studied enterprise, four macroprocesses were identified, which were sustained by 21 support processes, in addition to three management processes. The strategic aims were determined by the internal and external environmental analysis, resulting in five priority items, and the processes considered critical to achieve them were described by flow diagrams. The strategies to achieve the goals were determined by the Porter General Strategies method, where the differentiation option was chosen for the two main macroprocesses, whose action focuses were different.

Key Words: agribusiness, agricultural systems, flow diagram, management system

Aplicação de modelo de gestão por macroprocessos em empresa de pecuária de corte: um estudo de caso

RESUMO - Objetivou-se, por meio de um estudo de caso, propor a implantação de um método de gestão orientado por macroprocessos para auxiliar na definição dos objetivos estratégicos de uma empresa de pecuária de corte, bem como das estratégias para seu atendimento, contribuindo com a manutenção e/ou o aumento da competitividade do negócio. O método propõe a utilização de ferramentas citadas na literatura, ordenadas de forma a orientar o raciocínio lógico dos gestores na montagem do sistema. No mapeamento dos processos da empresa estudada, foram identificados quatro macroprocessos, sustentados por 21 processos de apoio, além de três processos gerenciais. Os objetivos estratégicos foram determinados de acordo com a análise de ambiente interno e externo e resultaram em cinco itens prioritários; os processos considerados críticos para o seu atendimento foram descritos pelo método dos fluxogramas. As estratégias para atendimento dos objetivos foram determinadas pelo método das Estratégias Genéricas de Porter, e a estratégia da diferenciação foi a melhor para os dois principais macroprocessos, diferindo quanto ao foco de atuação.

Palavras-chave: agronegócio, fluxogramas, sistemas agropecuários, sistema de gestão

Introduction

One of the main challenges of managers today is to adapt the internal environment of their organizations to the constant changes of the external environment, which are becoming increasingly fast and influenced by a growing number of factors due to the globalization of the economy. Such changes cannot be controlled by managers, who can only act in the internal environment of their companies, where most of the obstacles to achieve their goals are often present.

Macroprocess management has shown to help companies in different industries become more competitive;

however, it is rarely used in agribusiness, particularly in beef cattle production companies, which generally do not apply modern management systems. This type of management allows aligning of the final process results with the company's mission and vision, adding value to the customers. This benefit is very valuable for beef cattle production, which, despite having evolved considerably in the last few years, still focuses more on supplying their internal needs, than those of the end customers, who ultimately sustain the business.

Despite the influence of external factors on the results of a company, the main problems are within the companies themselves (Durski, 2004). The so-called "failure seeds",

such as high costs, low quality processes and resulting products, slow decision making, organizational crawl, lack of objectives and clear and defined strategies for action, etc., are planted several years before problems emerge, and their effects are progressively felt until the end.

There is a consensus (Neto, 1997; Hamer, 2002) that innovation and professional management are increasingly important production factors, and indeed essential for business survival. However, there are few studies showing the operational face of these factors applied to beef cattle production. How they should be implemented? Which are the best tools? Which sequence of actions leads to the best results?

The objective of this study was to contribute with answers to these questions using a case study of a beef cattle production company, proposing the implementation of a management method guided by macroprocesses to aid managers to define strategic goals and strategies to achieve them, thereby contributing to maintaining and/or increasing business competitiveness.

Material and Methods

This case study used a methodology based on concepts reported in the literature. It was carried out at Guatambu Farm, Dom Pedrito, RS, Brazil, with an area of 10.000 ha, distributed in five production units. One of the criteria used to choose the company was that it develops the complete cycle of beef cattle production, including breeding, and therefore performs a wide diversity of processes. In addition, the company is also a reference in that industry due to the high technology levels applied to its production system and its high productivity indexes, making it nationally and internationally renowned.

The study was carried out based on the interaction between the researcher and the employees, particularly the members of top management, to whom the project was presented to explain the study methodology and to motivate them to apply the proposed method. In order to put the analyses into context, it must be mentioned that the study was carried out in April, 2007.

The proposed methodology was divided in two broad action groups, called step 1 and step 2. During step 1, the aim was to know the company, how it was organized, the business sector in which it was inserted, its main products, and finally, its mission and vision of the future, which should be established if not already defined, because the subsequently determined strategic objectives must be closely linked to them in order to ensure their compliance. During step 2, in a logical sequence to build the management

model, the system overview was analyzed, process hierarchy was described, the external and internal environments were analyzed, strategic objectives and strategies were determined, processes were prioritized, and critical processes were described.

The analysis of the overview of the system graphically showed macroprocesses and the main processes, providing the general scenario of the business. In this approach, according to Rummler & Brache (1994), the organization is a processing system that turns several inputs into product and service outputs, which are supplied to receiving systems or markets. It is guided by internal criteria and feedback, but ultimately steered by market feedback, in addition to suffering the influence of competitors that compete for the same inputs and market, and are inserted in the same social, economic, and political environment.

Subsequent to the implementation process, a map showing the process hierarchy was drawn, using the so-called "Relationship Map" (Rummler & Brache, 1994), allowing understanding of how the work was presently carried out, identifying and supplying the missing links of the chain, and evaluating alternative paths to group personnel and to establish hierarchies.

The mapping of business processes – an essential step for the implementation of the proposed management system –, followed the hierarchy theoretical basis described by Harrington (1993), where "Macroprocess" is a process that usually involves more than one function in the organization structure, and its operation significantly impacts how the organization functions. A "Process" is a set of sequential (connected), related, and logical activities that take the input from a supplier, add value to this input, and produce an output for the consumer. A "Subprocess" is the part that, logically interrelated to another subprocess, accomplishes a specific objective, supporting the macroprocess and contributing to its mission. "Activities" are events that occur within a process or subprocess. Activities are usually performed by a unit (person or department) to achieve a determined result, and are included in the flow diagrams. Finally, "Tasks" are a specific part of the work, i.e., the smallest micro-focus of the process, and may be the only element and/or subset of an activity. Tasks are commonly related to how people, or a work team, perform a specific function.

The process map contributes considerably to learning and improving the processes by examining the input-output relationships it depicts. Mapping allows identification of critical interfaces, definition of opportunities of process simulation, implementation of accounting methods based on activities, and identification of disconnected or illogical points (Villela, 2000).

Environmental analysis is essential to situate the company within the general market context (external environment) and to identify, by a self-criticism exercise, the strengths to be exploited as competitive advantages and the weaknesses that need to be treated as improvement opportunities (internal environment).

The importance of external analysis is associated to the need, whenever feasible, to have managers and other responsible people forecast future events that may affect their organization. Changes in the external environment always homogeneously affect all organizations that act in the same geographic area and the same market, and therefore represent the same opportunities or threats to all (Porter, 1989). In this analysis, we used Porter's "Five Competitive Forces", which approach competition aspects within the industry itself, suppliers' negotiation power, customers' negotiation power, entry of new competitors in the industry, and the threat of product substitutes.

Regarding the internal analysis, the use of the SWOT matrix allows the identification the main strengths and weaknesses of an organization at a determined time (Bicho & Baptista, 2006). The proper listing of a company's strengths and weaknesses provides important elements to its strategic orientation, which will try to profit from the organization's strengths, and to diminish its weaknesses as much as possible. As happens with the external environment, the internal environment must be permanently monitored.

Based on environment analysis, the goals to be achieved to increase productivity, market share, and profitability are determined. This is done by the company board for the macroprocesses and the processes that are considered strategic, as based on market opportunities internal potentials in terms of available resources.

In order to determine how the defined goals can be achieved, the best (most appropriate) strategy is determined according to the Generic Strategies model proposed by Porter (1989), which includes three different lines of action: (a) cost leadership, when the company directs all its efforts to operational efficiency, seeking profitability by acting on expenses; (b) product differentiation, which is the opposite to the previous strategy, and is based on the assumption that the market is willing to pay a premium for a differentiated product with superior performance (Ferreira & Barcellos, 2001; Brizola & Castro, 2006); and (c) focus strategy, where the company concentrates on a niche market or a specific group of customers. The latter can also focus on costs or differentiation.

Considering that inputs are always limiting in a production system, the manager must prioritize their use. In

order to make this task easier, a crossover between the determined goals and processes is carried out to identify which processes are critical for achieving the goal by identifying their level of relationship, ranking the impact of the process on each goal as high, intermediate, or low. A process is considered critical when it highly impacts several goals and/or its current performance is considered insufficient by the managers.

Once identified, the critical processes are described using the flow diagram method, which provides a graphic representation of activity flows and their critical points, indicating the existence of operational Standards and instruction standards for some activities whose tasks are considered more complex, requiring codes and specific training (IS). According to Müller (2003), flow charts are essential tools to understand industrial processes. They depict the activities of the existing and proposed processes, allowing visualization and analysis of the relationships among departments, activities, physical flows, information, etc., as well as the impact of the proposed changes. In summary, the essential function of flow charts is to document a process to allow the identification of areas that need to be improved. The codification proposed by Harrington (1993) was used to build the flow charts.

Results and Discussion

Guatambu Farm is a family-owned company that acts in beef cattle production, crop production, and more recently, in wine production as a diversification option, profiting from the specific characteristics of the climate and soil of the region.

The company is known for its use of cutting-edge technology, both in crops and beef cattle production, as well as the integration between crops and beef cattle production. The company is run by the family, and has professionals (veterinarians, agronomists, and technicians) working full- and/or part-time in the company, and an operational team for field work, in addition to the office employees, which is located on the farmstead. Third-party consulting is also contracted for some strategic areas.

Beef cattle production is developed with the breeds Polled Hereford and Braford under a complete production cycle system, that is, breeding, rearing and finishing, in addition to sire production. The beef cattle production system is based on the use of natural and cultivated pastures, as well feed production (silage, hay, and grains) for supplementation during periods of critical pasture production, which usually occur in winter. The "One-year

System” is applied, with heifers beginning breeding and steers slaughtered between 13-15 and 24 months of age. The production of sires is one of the company’s main businesses, using high technology in the process of genetic selection. The main crops produced are irrigated rice, hybrid corn irrigated by central pivot (silage and grain), soybeans, sorghum (silage and grain) and forage seeds.

The mission of Guatambu Farm is to produce primary foods (meat and grains) in an optimized and diversified manner, using natural resources, and maintaining the sustainability of the system. Its goal is to be acknowledged as one of the best agricultural companies of the south of the state of Rio Grande do Sul in terms of productivity and product quality (beef cattle production and genetics) by 2007.

The overview of the system shows, in a summarized diagram, the business of the company and general functions of the organization, highlighting the main macroprocesses, processes, and subprocesses (Figure 1).

Four macroprocesses were identified at Guatambu Farm: production of food, calves, finished cattle, and sires. The macroprocess “food production” supports all the animal production sectors, and therefore the company may be considered as a large plant for producing feed, which is used as input to obtain the final products. The macroprocess “calf production” supplies the raw material for the main two business products of the company, and consists of five processes, which are the foundation of the animal breeding activity.

The macroprocess “Sire Production” is highly specialized; it includes three processes and accounts for the products that are one of the most renowned company

products – Polled Hereford and Braford genetics. The customers of this macroprocess are companies of the same industry (beef cattle breeders) that use genetics as one of their main production inputs. In addition, this genetics is also used as an internal input for calf production. Other customers are artificial insemination centers, which sell beef cattle genetics by processing and selling semen of the best sires from the program of genetic selection, representing 1% of the annual sire production.

The macroprocess finisher production consists of three processes. Its customers are packing companies, which have different requirements as to carcass weight, age, and finishing.

The main management processes are strategic planning, accounting/finances, and human resources (Figure 1). As to the supporting processes (Figure 1), three – production control, health control and field operations – have a broader influence on the organization, affecting more than one macroprocess.

Animal purchase is a subprocess that can strategically be used to support the macroprocess “Finisher Production” as a way of using the surplus of food produced during determined periods of the year or during years that are extremely favorable to forage production. It functions as an adjustment mechanism to maximize the use of inputs as well as production.

Still in the internal environment, the importance of the so-called “production control” process is highlighted. It is performed by the board and technical body, and its objective is to match the available resources to the requirements of each animal class during the entire production cycle, taking into account the different factors that influence production. This process is not coded, as it involves a high degree of implicit knowledge, i.e., it is difficult to be formally explained, as it is subjective and inherent to the individual’s skills.

The field operations process is responsible for the general management of the animals, including health care and general welfare, as well as animal movement and inventory control. It represents the activities, known as “shop floor” activities in manufacturing, which are carried out by the stockpeople in the company. The stockpeople also significantly contribute to the production control, as they have direct and daily contact with the production system, detecting problems and suggesting corrections to the processes.

Health control is also a critical process for the activity, receiving special attention from the board and veterinarians, as the health status of the herd is considered, along with

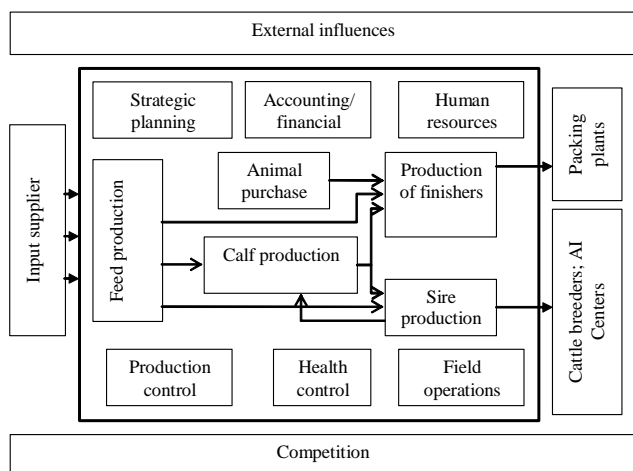


Figure 1 - Analysis of the general view of the system – Guatambu Farm.

nutrition and genetics, as one of the pillars of animal production. The main goal is to maintain herd health, allowing the expression of the maximum genetic potential with the available nutritional resources.

The company does not have a formal (coded) strategic planning process. Planning is decided by the board with the aid of the technical team and consulting companies, resulting in a set of guidelines and projects that are communicated to the employees that execute them.

The accounting/finances process is carried out by the employees, with external consulting both in the fiscal and managerial areas. The outputs are compliance to the legal requirements of the Brazilian tax system and to the administrative financial reports that support the board's decisions.

The human resources sector is managed by the office employees, with a specific employee designated for this function, aided by consulting in occupational medicine.

Another aspect of the general analysis of the system is the competition faced by the company, which is different for each of the main generated products. In the case of sires, competition is fierce, because the region has a long tradition in beef cattle genetics, with several companies competing on the local and regional market. There is competition among breeds, by valuing sire production and adaptation traits, and within the same breed, measured by expected progeny differences (EPD), because the general traits of competing products is very similar. However, the diversity of genetic lines selected within the same breed by different companies has generated product differentiation, making within breed competition increasingly fiercer. The competition in the case of finishers has low impact on the business, as the product has high liquidity on the market.

When analyzing the external influences on the business, there is, of course, a wide range of factors, but we highlight weather, due to its direct influence on feed production (foundation of animal production), and the regional and national health status of the beef herd, due to the stringent market restrictions all over the world, and the macroeconomic national policies, particularly in terms of foreign exchange, interest rates, financing and defrayal, among others.

The diagram of the processes of Guatambu Farm (Figure 2) shows how macroprocesses are sustained by the different supporting processes, as well as how they relate to each other. The main managerial processes are shown in the checkered boxes. The company uses the strategy of adding value to its products by continuing the production cycle, transforming calves into finishing or breeding animals (sires and heifers). There are different

production possibilities, as calves have high market liquidity (they can be directly marketed or continue in the production cycle.) From calves, the company may direct higher animal flow either to the production of beef or of sires, according to the market trends, which present typical high and low cycles for both products. This production flexibility allows the company to better adapt to changes in the external scenario, maintaining more homogenous financial results over time.

During the analysis of Porter's Five Competitive Forces (Porter, 1989), the members of the board mentioned, for each force described by Porter, the main factors that stimulate or depress each of the evaluated businesses.

In sire production, the factors high demand for sires (due to the current good situation experienced by beef cattle production), the high prices obtained by Hereford and Braford sires, easy access to genetic selection programs, and the status of the farmer that produces genetics were mentioned as factors that may incentive newcomers, increasing competition. Consequently, factors such as higher offer of sires on the market and favorable purchase conditions increase the buyers' negotiation power. According to the company managers, the increase in service costs depends on the demand increase.

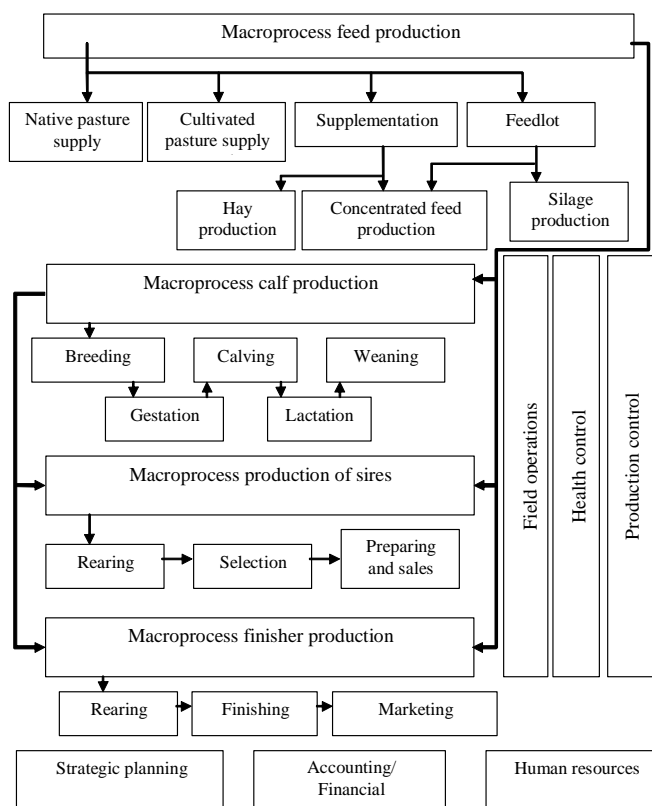


Figure 2 - Process hierarchy on Guatambu Farm.

When the threat of substitute products is analyzed, the increasing use of fixed-time artificial insemination may be considered as a threat to the sales of sires to farmers, as the broad use of this technique decreases the need of sires for natural breeding. On the other hand, artificial insemination stimulates a higher demand for semen, which also benefits sire producers, but on a lower scale.

In the analysis of the sire production process, the competition among breeds and genetic lines within the same breed, and the dispute in the ranking of the breeders' associations through scores given in judging contests, were mentioned as threats. The rivalry within the same breed occurs through different genetic lines and rearing systems, as observed in judging contests at fairs and exhibitions, which are the main fields of dispute in this sector.

In finisher production, the opening of new areas for beef cattle production on the agricultural frontiers of the central west and north of Brazil that increases the offer of cattle on the market, was mentioned as a factor that favors newcomers. As to purchasers' negotiation power, a highly consolidated packing industry (oligopoly), lack of farmer organization and lack of product standards that depreciate the price paid to the farmer, were mentioned as factors that strengthen competition. The health status of beef herds in the state of Rio Grande do Sul, which is different from that of the states of the central-west of Brazil due to the incidence of foot-and-mouth disease, presently precludes imports of finishers and meat with bones from those states, decreasing purchasers' power, and thereby benefiting local farmers. In addition, the purchase of animals for finishing is encumbered by the inflated prices caused by low offer, which strengthens the suppliers' negotiation power.

Changes in the feeding habits of the population (fast food and vegetarian diets) and the lack of standardization of the final product (particularly in terms of meat tenderness), the high standardization of competing chains (chicken meat and pork), the increasing use of vegetable protein (e.g., soybeans) and the perception that red meat is harmful to human health (encouraging lower consumption) are factors that strengthen the use of beef substitutes.

The competition within the beef industry was considered as virtually non-existent, by the managers with a low impact on their business.

The SWOT analysis (Bicho & Baptista, 2006) was performed considering the overview of the company, revealing priorities for each sector of the matrix. The analysis showed a contrast between the high technical skills presented by the board and the technical team and the need for training of the operational team (Figure 3).

<p>Strengths</p> <ul style="list-style-type: none"> ▪ Feed production (quality and quantity) ▪ High technology level; ▪ Available genetic material; ▪ Work capacity of the team; ▪ High skills at managerial level; ▪ Known brand. 	<p>Weaknesses</p> <ul style="list-style-type: none"> ▪ Low education level of the operation team; ▪ Insufficient training and capacity building; ▪ Low health level of work in the fields.
<p>Opportunities</p> <ul style="list-style-type: none"> ▪ Differential marketing of beef from British breeds; ▪ Geographical identification of the meat; ▪ Current high value of animal products; ▪ Expansion of the Braford breed in RS and Central Brazil. ▪ Semen sexing technology. 	<p>Threats</p> <ul style="list-style-type: none"> ▪ Financial fragility of the regional packing companies; ▪ Equalization of RS health status with that of Brazilian central-west states; ▪ Expansion or artificial insemination; ▪ Lack of rural schools and infrastructure.

Figure 3 - SWOT analysis of Guatambu Farm.

The two tools used for the environmental analysis proved to be complementary, as a change in the managers' perception was observed when the environment analyzed using the technique of Porter's Five Competitive Forces was seen from the perspective of the SWOT matrix, which compares opportunities and threats to the organization's weaknesses and strengths, making very clear which possibilities and paths should be exploited by the company. This emphasizes the importance of the joint use of these tools to guide very broad analyses, such as those considering the external and the internal environment.

Based on the analyses of the internal and external environment, the company defined strategic objectives for the macroprocesses and processes considered as critical. The objective of the macroprocess sire production was to increase the marketed volume keeping the sales price. For finisher production, the objective was to increase the company's participation in higher-value market niches by producing animals that supply the requirements of these markets as to age, carcass weight, and finishing, in addition to improving productivity (kg meat/ha). The objectives of human resources were to train operational personnel to improve their skills, and to reduce repetition strain injuries.

The managers defined as strategy for achieving the business goals of the macroprocess sire production to increase product differentiation and to extend the competitive market. The following strategic actions were therefore adopted: a) valuing of the time the company is in this business (selection time); b) broadcasting their main auction by cable TV (Canal Rural); c) intensifying post-sales services; d) production of biotypes aimed at meeting

specific requirements, increasing the use of breeding guided by genetic traits; e) providing special payment conditions to customers; f) showing the products to the customers in field days and by participating in animal fairs; g) improving sire feeding and health conditions in order to achieve the weight gain and finishing required for their optimal presentation.

The strategy adopted for the finisher production macroprocess is product differentiation within the competitive scope aiming at higher-value market niches, both in the domestic and foreign markets. The defined strategic actions were: a) to increase forage production by crop integration and increasing soil fertility; b) to improve animal standardization through nutrition and genetics; c) to comply with health requirements by maintaining and improving herd health status; d) to organize groups for joint sales; e) to promote the debate on red meat use in human nutrition with the associations linked to the beef industry; and f) to strengthen the geographic denomination Carne do Pampa Gaúcho da Campanha Meridional, through the associations linked to the beef industry.

Due to their importance for the company, strategic actions were also determined for human resources processes: a) improving the hiring system; b) planning

and prioritizing training programs; c) improving work equipment; d) implementing task rotation (reduction of repetition strain lesions); and e) selecting work horses (lower trot impact while riding).

To identify which processes most affected the strategic objectives, processes and objectives were compared to guide the choice of processes that required description and standardization (Table 1).

The present level of control and performance, from the perspective of the board, were also considered, as well as the required complexity, which varies according to the level of tacit knowledge involved in the process. This last factor explains why crucial processes, such as production control, were not selected to be described.

The processes selected as critical were described through the flow diagram method, as shown in Figure 4.

This description work counted on the participation of the company's professionals and stockpeople because of their deep knowledge of the company's operational reality. Their participation is essential to make the descriptions true and reliable, as the knowledge and experience of these employees, coded in the flow diagrams, can be transmitted to future employees during trainings. This allows the company to incorporate learning and to master the technology of its processes.

Table 1 - Process impact on the company's strategic objectives

Macroprocess		Production of sires		Production of finishers		Human resources	
Strategic objective		Increasing marketed	Increasing the	Increasing	Increasing level	Decreasing	
Process	Description	volume maintaining sales price	participation in higher-value niche markets	productivity (kg/ha)	of skills of operational personnel	repetition strain lesions	
Natural pasture supply		high	low	high	low		
Cultivated pasture supply	yes	high	high	high	low		
Supplementation		interm.	interm.	interm.	interm.		
Feedlot		low	high	high	interm.		
Manufacturing of concentrated feed		low	interm.	interm.	interm.		
Silage production		low	interm.	high	interm.		
Breeding	yes	interm.	interm.	high	Alto		
Gestation	yes	interm.	interm.	high	high		
Calving	yes	interm.	interm.	high	high		
Lactation	yes	interm.	interm.	high	high		
Weaning	yes	interm.	interm.	high	high		
Rearing	yes	high	high	high	interm.		
Selection	yes	high	interm.	interm.	low		
Sire preparation and sales	yes	high			interm.		
Finishing			high	high	interm.		
Marketing		high	high	low			
Health control	yes	high	high	high	interm.		
Field operations	yes	high	high	high	high	high	high
Production control		high	high	high	high		

Process standard

Process: Field Operations		Number/review: PA 1 / 1	
Objectives: Animals counted and reviewed Identified, solved or registered problems Implemented and recorded stocking rates			
Flow	Activity	Key Points	Standards
	To define the area to be covered	There must be a standard, preestablished area changes can be arranged, according to the needs	
	To have information on animals existing in each paddock	Consult animal stocking rate and inventory chart	
	Provide horses		PO 210
	Check the required equipment (med., needles, etc.)		PI 102
	General counting	In lots with more than 100 heads, count 2 to 3 times weekly; smaller lots, daily	PO 224
	Individual animal revision		PI 106
	Provide required treatments		PI 101 PI 102
	Ask for help	Whenever possible, take the animal to the handling facilities	
	Observe body condition of the animals	Warn if body condition is reduced	PI 103
	Observe pasture height	Warn if pasture is too high or too low	PI 103
	Change stoking rate as required and/or as needed		
	Check fences, water supply, salt troughs, and the presence of trash in the field		SOL in the field
	Record/report events, observations, and changes made	Communicate the problems directly to the person that will solve them, and superior	PO 215

Figure 4: Description of the process Field Operations.

Conclusions

The proposed methodology orderly and didactically allowed the establishment of a management program using macroprocesses. The result applying the methodology in the company is directly related to the quality of the analyses performed by the team responsible for its implementation. The management system must be continuously reviewed

and updated as a function of both economic and technical changes in the external environment. In addition, the company must continuously strive for the continuous improvement of internal processes. The results obtained by applying the proposed methodology are valid only for the studied company and for that specific moment in time. It is essential to build a set of indicators that monitor process performance to complement the management system.

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