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CONSOLIDATION OF A COST INFORMATION SYSTEM FOR DECISION-MAKING IN THE LIVESTOCK SECTOR

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Abstract

The aim is to consolidate a cost information system to support decision-making in the livestock sector. From the theoretical-documentary perspective, specialized documents supporting the studied variable were discussed; this allowed the design of a questionnaire-type information collection instrument. To determine the sample, stratified random sampling with proportional affixation was assumed, consisting of 36 production units with specific characteristics and grouped by strata in the different parishes that make up the municipality of Valmore Rodríguez. There is an incipient management at the administrative level in the units studied, even more from the accounting and cost perspective, the absence of accounting records limits the availability of accurate information on processes and costs. These findings lead to a proposal for cost consolidation from the integral perspective of its processes, this proposal integrates the primary stages of the agro-productive chain that prevails from the informality of its structures in this region. It is concluded that a culture of enterprises must be created in these small and medium-sized production units so that they can grow, be productive, profitable and competitive, even in the midst of the crisis that the country is experiencing, from the formality of its management.

Keywords: cost management, cost information system, dual purpose cattle farming

1. Introduction

Cost management in organizations requires willingness, discipline and commitment on the part of those who exercise it. By adopting it as part of their management philosophy, entrepreneurs, regardless of the industry in which they operate and the size of the organization they lead, will be able to support their decisions with accurate, reliable, up-to-date and timely cost information.

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This situation is becoming more relevant in the Venezuelan environment, which is characterized by constant and rapid changes in the political, economic, legal, social (cultural), technological and environmental spheres. This means that business leaders, directors and managers have administrative and accounting information specifically focused on costs, to support their decisions, support the development of plans and monitor the performance of the organizational systems they lead (Montes de Oca, 2020).

The analysis of cost management in agro-productive chains requires a holistic view of the organizations, where not only the internal environment is important, but also the recognition of the context that surrounds them in order to carry out approaches from a holistic perspective. The use of holistic approaches, which combine qualitative tools characteristic of administration and/or management, with other quantitative tools offered, in this particular case, by cost accounting.

This research, focused on the study of the livestock sector, starts from the fact that in the production units that make up the sector, there is no concept of a company with work processes organized from the formalities, nor are there, from the accounting point of view, production and cost records (specifically in small and medium-sized companies) that support or sustain decision-making processes (daily and strategic ones).

Thus, in order to promote innovative management methods and increase production performance, the central objective of the study is to consolidate a cost information system for decision-making in this type of production unit, from the broader view established by agro-productive chains. The aim is to provide guidelines for the implementation of truthful information systems that provide timely cost information to support decision-making, while helping to consolidate the long-awaited competitiveness of this strategic sector in Venezuela.

2. Materials and Methods

This research was carried out in a region located on the Eastern Coast of Lake Maracaibo, specifically in the municipality of Valmore Rodríguez, which has an area of 1,292 km2, occupying 2. 24% of the total area of Zulia State. This municipality is politically divided into three (3) parishes: La Victoria, Rafael Urdaneta and Raúl Cuenca (CORPOZULIA, 2011), with a population of 52,624 inhabitants, according to the 2011 census (INE, 2014).

Table 1 shows the agroecological zones of the region:

Table 1
Agroecological zones of the Lake Maracaibo Basin

Agroecological zones: Lake Maracaibo basin	Municipalities	Agroecological characteristics

Northwest	Mara Guajira Cañada de Urdaneta Jesús Enrique Lossada	Very dry forest and tropical dry forest
Perijá	Rosario de Perijá Machiques de Perijá	Tropical dry forest
South of the Lake	Sucre Colón Catatumbo	Tropical humid and very humid forest
East Coast	Baralt *Valmore Rodríguez* Lagunillas Cabimas Santa Rita Miranda	Dry and very dry tropical forest.

Source: Own elaboration based on Velasco and Padrón (2011)

The production units located there perceive an average annual temperature between 35 and 40°C, with six months of winter (rain) and six months of summer. Thus, the best period for the growth of pasture intended for livestock feed is between the months of April and June, and the second optimal period is between September and December.

The topographic profile of the production units shows that 86% of the production units have a flat surface, while the remaining 14% have a mixed surface, i. e. a combination of undulating and flat spaces. There are differences in the availability of water resources between the farms studied. Although some have rivers (28%), lagoons (14%), the jagueyes are the most representative with 36%, while 17% argue that they do not have any of the above. These resources are not used exclusively on the farm, they are combined with others such as lagoons, reservoirs or wells in order not to dispense with this resource so important in the development of this type of activities.

Only 3% of farms use wells as their main water resource in their production operations. The drilling of wells is used as a secondary strategy on 25% of the farms, given the costs associated with this decision; however, this represents an important competitive advantage over the rest of the production units: in the summer months, when the plant mass (grass) decreases due to the absence of rainfall, these farms can maintain a high volume of it by means of the irrigation it provides. water from their well, ensuring a constant quality feed for the herd.

Geographically, this oil region has fertile areas used for agricultural development, producing maize, among other crops such as sorghum, cassava, banana, and fruits such as lemon, auyama and parchita. As for livestock activity, it is at a low level within the municipality; however, at the

state level, it is one of the best producers of cattle, pigs, poultry, eggs and milk. In the research, methodological tools were applied, delimiting under a stratified random sample with proportional assignment, 36 dual-purpose livestock production units, with characteristics of small and medium producers, distributed in the three parishes mentioned above.

The information units selected for the study, taking into account information related to the variable cost management. The scientific and technical support on the variable was supported by specialized scientific documents that address the subject.
The approach to reality began with visits to institutions and actors, recognized as key informants for this research. Once the sample was established, stakeholders were sensitized through introductory workshops to publicize the research objectives and collect data using the survey technique, using a structured questionnaire. Support was obtained from the managers of the production units, considered as key actors in these organizational processes.

After the fieldwork, the results obtained were classified and recorded in a database designed for the purpose of data processing, using Excel and SPSS version 10, to extract data of interest and proceed to their analysis and discussion. Descriptive statistics are presented in tables, tables and graphs.

The quantification of the producers was carried out from a database of the area, which has 581 production units, located in the different parishes of the municipality Valmore Rodríguez (Dr. Raúl Cuenca, Rafael Urdaneta and La Victoria), and has information on: geographical location, inventory of self-propelled vehicles, animals being milked, average milk daily, destination of production, among others. An approximation was made to a specific number of livestock farms, based on previously defined criteria.

Since the population was considered large and difficult to access, and the resources for research were limited, preventing its total approach, it was decided to calculate a sample. This required the analysis of the units contained in the database and some conversions to achieve standardization of the herd. Based on this, parameters established by the Coordinating Unit of Joint Projects (UCPC) of the University of Zulia (1994) (Table No. 1. 1) are assumed to achieve unification of the herd, leading it to the "Bovine Animal Unit (UAB) ", from which criteria are established for the selection of the sample.

Table 1. 1
Conversion factor for self-propellers

Cattle	Conversion factor
Bull	1,5
Cow	1,0

Novillo	1,0
Heifers	0,8
Tolls	0,6
Tolls	0,6
Calves	0,3
Calves	0,3

Source: UCPC (1994), International Standards

Once the corresponding calculations were made to achieve the required conversions, the UABs per farm were obtained, the basic element for the selection of the sample.

To determine the sample, it was necessary to establish criteria in line with the previously defined objectives of the research, taking as mandatory criteria the following production units to be considered:

a. The production units selected must be dedicated to dual-purpose cattle farming, with a tendency towards milk production (a criterion that is fully in line with the central objective of the research, which establishes the study of dual-purpose cattle farming).

b. Farms must be economically active, with a herd greater than or equal to 20 UAB; that is, they must generate constant cash flows from the daily sale of milk and that allow the maintenance of an average family nucleus of 5 people (at least one season of the year-rainy season).

Based on these criteria, 223 livestock farms were discarded from the population of 581 production units because they had a herd of less than 20 AWUs. The remaining 358 units included farms with herds of at least 20 UAB up to 1543 UAB, a population still considered to be very heterogeneous, in addition to not having sufficient resources for full access.

In order to ensure greater homogeneity in the analysis units, a stratified random sampling was assumed, which implies dividing the total sample into parts proportional to the size of each stratum in the population. The characteristics of the research demanded mutually exclusive and collectively exhaustive groups called strata, to then select a simple random sample within each stratum separately. The aim was to obtain homogeneous groups within it, which allowed for a smaller selection for each stratum separately. Stratified random sampling "reaches its greatest efficiency to the extent that the strata are as homogeneous as possible within them and, at the same time, as heterogeneous as possible between them" (Parra, 2006:59). The strata were defined from the grouping of farms by parish.

Subsequently, the relative share of production units (farms by parishes) was estimated according to the total population, leaving the sample (n) constituted by 36 farms, distributed by parishes (Table No. 1. 2).

Table 1. 2
Sample by parishes

Parishes	Production units by parish	Relative share of farms per parish in relation to total population*	Farms by parish to be studied (10%)
Raúl Cuenca	180	50%	18
Rafael Urdaneta	99	28%	10
La Victoria	79	22%	8
TOTAL	**358**	**100%**	**36**

Source: Prepared on the basis of the database provided by IMDAVAR

To select farms by parish, they were grouped by strata defined according to the size of the herd expressed in UAB, and the selection was made using random numbers, as many numbers as farms to be studied by parish. Subsequently, the strata built were established, as well as the estates to be studied in each of them, and the relative participation of the estates to be studied by strata and parishes in the municipality of Valmore Rodríguez was expressed (Table 1. 3).

Table 1. 3.
Sample by strata

Strata \ Parishes	Raúl Cuenca	Rafael Urdaneta	La victoria	Total sample	Relative share
Strata 1 (20-60 UAB)	12	4	4	20	55,6%
Strata 2 (60-100 UAB)	2	2	2	6	16,7%
Strata 3 (100-180 UAB)	4	4	2	10	27,8%
Total	**18**	**10**	**8**	**36**	**100,0%**

Source: Prepared on the basis of the database provided by IMDAVAR (2011)

Subsequently, the 36 corresponding farms were randomly selected, with support in a sample frame defined according to the defined criteria. Once the farms were selected, field work began, which led to the subsequent obtaining and analysis of results.

3. Analysis and discussion. Strategic guidelines for the formation of a cost information system for decision-making

Cost management in small and medium-sized livestock systems requires willingness, commitment, discipline, constancy and organization from those involved. Adopting it as part of the management model, it will enable strategic vision of the agricultural business and support decisions with accurate, reliable, up-to-date and timely cost data. For this reason, business leaders, producers and managers must have economic-accounting information specifically focused on organizational costs.

In this research, these costs refer to the costs incurred in each of the links that make up the primary agro productive chain of the livestock sector of the Zulian region, specifically the one operating in the municipality of Valmore Rodríguez of the Zulian region. However, despite being a tax-exempt sector, it requires information for management decision-making.

According to Mendoza (2008), "the business is really favorable economically, but the money does not reach the flows immediately, on the contrary it remains "walking in the fodder" for an important period of time", a situation that with regulated prices, highly volatile markets and a highly inflationary environment, can harm those who dedicate themselves daily to the development of this activity.

For the above arguments, it is necessary to build the support and path for the livestock business, which, like others, must be seen from the formality that requires undertaking and developing highly efficient and competitive organizational systems. Innovative entrepreneurs willing to accept the challenges and challenges imposed by the reality of livestock in a context of changes, controls and demands by key actors (government-society). At the same time, they are willing to change paradigms and adopt management models in line with current realities.

As part of the proposal, to manage costs in the dual-purpose cattle agri-productive chain, each of the links identified above would be constituted as macro cost centers. These need to be broken down into cost centers and sub-cost centers, as appropriate, according to the processes and activities developed in the production unit. Each with defined cost lines and specific transfer and allocation processes.

Once the cost centers, directly associated with the phases of the agro-productive chain, are formed, will be identified, accumulated, transferred and allocated costs in the chain, with the most

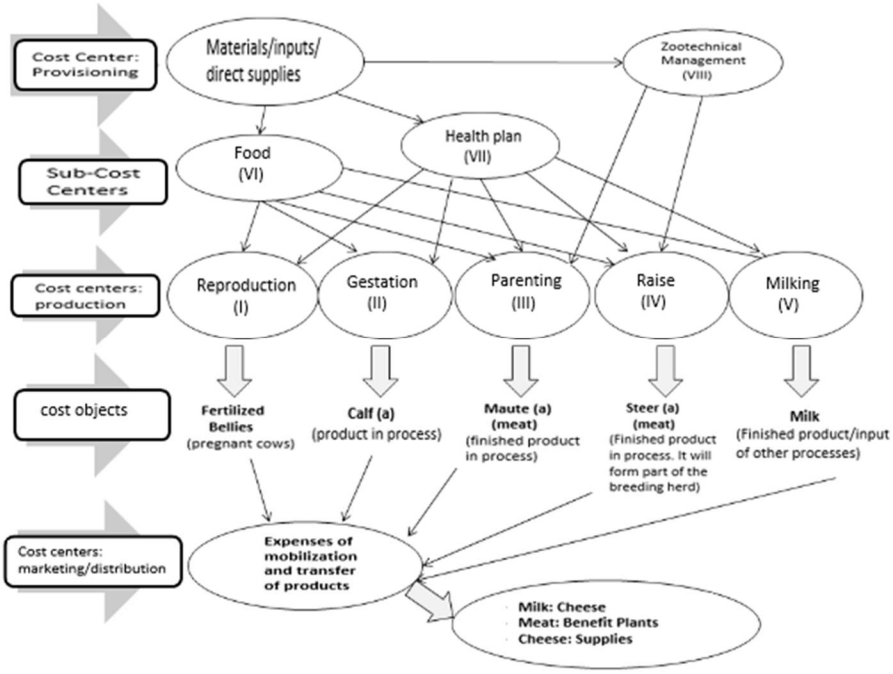
representative being those accumulated in the "production" cost center, given the nature of the units studied.

It is proposed to accumulate costs by process, adopting a costing system by process, department or cost center, as an accounting tool adapted to the production system developed in these production units.

Material costs are accumulated at the procurement stage, then transferred to the production stage and supplemented by direct lab our costs and indirect manufacturing costs. Subsequently, these will be supplemented by the costs accumulated during the marketing phase, which in the systems studied is not under the control of the producer-managers. These accumulate according to the levels of marketing and distribution present in the system.

With regard to the costs accumulated in the production link, the main cost centres are the stages of the process according to the bio-cycle of the self-winding unit, and as sub-cost centres, the considered processes or stages of support to the production process. While the costs of moving intermediate and final products will be accumulated in the cost centre: marketing/distribution (Diagram No. 7. 2).

Diagram No. 7. 2
Costs in the agro-productive chain: Cost centers and sub-centers



Source: Own elaboration

In each of the centers and sub-centres defined, decisions related to efficiency, effectiveness, performance, productivity, quality, timeliness, and factor costs will be made.

In these cases, it will be possible to define indicators to measure the technological efficiency of production inputs by management areas (reproductive management, pasture management, food management, sanitary management); the physical productivity of production factors, including: herd, area, lab our, capital; the economic productivity of the herd or area; among other aspects that may be required and on this basis. make decisions.

This situation is complicated in the systems studied by the lack of data for its calculation, thus preventing the fulfillment of requirements of feasibility, validity and simplicity to improve decision-making that results in effective actions (García, 1992:25-26).

By disaggregating each of the proposed centres and sub-centres, from the perspective of cost accounting and considering the approach of the reality studied, it is possible to identify some cost items in them (Tables 7. 1 to 7. 5). Based on the resources identified in the production units studied, specific guidelines for their cost management are proposed, which will serve as a basis for establishing basic and general assumptions for a possible cost management in the agro-productive chain of dual-purpose cattle farming systems.

The procurement cost centre accumulates the costs associated with the purchase of materials, inputs and supplies required in the production process. As a cost centre, it includes the costs of all inputs purchased by the production unit. Table 7. 1 specifies the inputs/materials required for food production and ensuring animal health and welfare of the self-propeller.

Table No 7. 1
Cost centres Provisioning: Accounting items

Accounting items	**Cost centre Supply**	
Direct Materials: Raw Material / Inputs	**Variable**	**Fixed**
Seeds	X	
Fertilizers	X	
Agrochemicals	X	
Molasses	X	
Mineral salts	X	
Urea	X	
Concentrated feeding stuffs	X	
Flour	X	

Maize or sorghum	X	
Water	X	
Medicinal products	X	
Vaccines	X	
Gloves	X	
Miscellaneous inputs	X	

Source: Own elaboration

These inputs/materials are transferred to the food, sanitary plan and zoo technical management sub-centers. These processes are responsible for generating pastures, preparing food supplements and ensuring the health and well-being of the self-propeller. In order to allocate the costs incurred in these centres, it is necessary to define accounting criteria for the distribution of food, health plan and animal management resources to each of the main centres.
In this case, relationships related to the consumption required by each of the phases of the production process (reproduction, gestation, rearing, leavening and milking) are assumed. For example, in the case of feeding, a relationship between animal weight and food consumption will be established, for which international standards that establish averages for this relationship can be assumed. In the case of animal health, the biological stage at which the self-propelled device requires the greatest quantity of vaccines and medicines may be taken as a criterion. These and other criteria must be jointly defined by the producer and the person responsible for implementing the proposed cost information system.

With regard to the cost sub-centers: food, animal health and animal management, the inputs and materials identified in the previous cost centre (supply) are disaggregated as shown in Tables 7. 2, 7. 3 and 7. 4

Table No. 7. 2
Sub-Cost Food: Accounting Items

Accounting items	**Sub-cost centre (VI)**					
	Food (pasture)		**Food (supplements)**		**Feeding (Concentrated feed)**	
	Variable	**Fixed**	**Variable**	**Fixed**	**Variable**	**Fixed**
Direct materials: **Raw Material / Inputs***						
Seeds	X					

Fertilizers	X					
Agrochemicals	X					
Molasses			X			
Mineral salts			X			
Urea			X			
Concentrated feeding stuffs					X	
Flour			X			
Maize or sorghum			X			
Water	X		X			
Other						
Direct lab our						
Salaries of manual workers		X		X		
Indirect costs of production						
Depreciation of property, plant and equipment		X		X		
Maintenance of equipment (tractors, tractors, others)	X				X	
Rentals (tractor, tractor, other equipment)	X					
Electricity						
Other						

Source: Own elaboration

In order to obtain a more precise identification of the accounting items present at this stage, two cost structures with their respective items relating to food are presented below: (a) pastures and (b) food supplements. In the case of concentrated feeding stuffs, where only the purchase of the bags with industrially prefabricated feeding stuffs is required and does not merit any internal processing, they shall not be considered for the analysis of the consignments.

Direct materials such as seeds, fertilizers, agrochemicals, water, were identified in the results related to the pasture feeding stage. All of them necessary for the sowing of pastures, the main food of the flock. With regard to direct lab our, the only item identified was workers ' wages in 100% of the units analyzed, which is classified as a fixed cost because it represents the fixed

payment made to them regardless of the number of hectares sown by the workers. Results related to indirect production costs include depreciation of property, plant and equipment, fixed costs considering the straight line method. In this context, the item with the largest share in the cost of outputs is direct materials.

In order to obtain food (food supplements), inputs such as molasses, mineral salts, urea are required. Flour, maize or sorghum are identified in smaller quantities. All items are classified as variable costs according to volume of production, as their value depends on the quantity of kilograms of food supplements prepared in each production unit. The items relating to the element, direct lab our, showed that 100% of the units analyzed included the item of wages of manual workers, classified as fixed for the reasons explained above. Indirect production costs are identified by depreciation, rents, maintenance, among others that correspond to the corresponding production unit.

The food cost sub-centre is recognized as the one with the largest number of accounting items. These costs are controllable, i. e. their value in monetary units increases or decreases with the number of hectares that decide to plant with grass, or with the number of kilograms of food supplements that decide to prepare; however, the cost of inputs is subject to constant fluctuations due to fluctuations in the market and the inflation rate of the country.

The sub-centers for animal health and zoo technical management costs require smaller amounts of specific inputs. In these cases, qualified manpower is essential for the planning, execution and follow-up of sanitary controls of both the self-propelled vehicle and the production unit.

Table No 7. 3

Sub-centre cost Animal Health: Accounting Items

Accounting items	**Sub-Cost Centre (VII)**	
	Animal health	
	Variable	**Fixed**
Direct materials: **Raw Material / Inputs***		
Medicinal products	X	
Vaccines	X	
Gloves	X	
Other	X	
Direct lab our		

Salaries of manual workers		X
Indirect costs of production		
Depreciation of property, plant and equipment		X
Maintenance of equipment	X	
(tractors, tractors, others)	X	
Rentals (tractor, tractor, other equipment)	X	
Electricity		

Source: Own elaboration

Table No 7. 4

Sub-Cost Centre Zoo Technical Management: Accounting Items

Accounting items	**Sub-Cost Centre (VII)**	
	Animal health	
	Variable	**Fixed**
Direct materials: **Raw Material / Inputs***		
Medicinal products	X	
Direct lab our		
Salaries of manual workers		X
Indirect costs of production		
Depreciation of property, plant and equipment		X
Electricity	X	
Other		

Source: Own elaboration

With regard to the production cost centre, it is broken down into cost centres for each stage of the production process, since each of them produces products in process with intermediate outputs in these production systems, which must have a cost when deciding whether to leave the system (sale to third parties). The accounting items identified at this cost centre are detailed in table 7. 5

Table 7. 5. Cost centres Production: Accounting items

Accounting items	Cost centre (I)		Cost centre (II)		Cost centre (III)		Cost centre (IV)		Cost centre (V)	
	Reproduction		Gestation		Crianza		Levant		Milking	
	Fixed	Variable	Fixed	Variable	Fixed	Variable	Fixed	Variable	Fixed	Variable
Direct materials: Raw Material / Inputs*										
Feeding (milk) opportunity cost								X	X	
Feed pastures		X		X		X				
Feeding food supplements				X		X				
Concentrated feeding stuffs				X		X				X
Vitamins		X		X		X				
Medicinal products		X		X		X				
Vaccines				X		X				
Other				X		X		X		X
Direct lab our										
Salaries of manual workers	X		X		X		X		X	
Salaries of milkers									X	
Indirect costs of production										
Professional fees of veterinary surgeons		X		X		X		X		X
Depreciation of cowgirls	X		X		X		X		X	
Depreciation of pastures	X		X		X		X		X	
Depreciation of equipment (grass cutter)	X		X		X		X		X	
Tool depreciation (cantaros)	X		X		X		X		X	
Other										

* This item includes the costs accumulated in the cost centre and in the cost sub-centres for food, animal health and zoo technical management

In the cost centers that attend to the bio-cycle of the self-propeller, resources related to direct materials are not evident. These are accumulated in the cost centre provisioning and then redistributed as items in the sub-centres feeding, animal health and zoo technical management, from which they derive food and health and welfare for self-propellers at different ages.

The lab our force is represented by the wage cost of workers, who contribute the physical effort to carry out the management (rotation) of the bulls in the herds where the pregnant females are. The workforce is unskilled (low technical training) as evidenced by the results previously discussed. Depending on its relation to the volume of production, this cost is fixed, since regardless of the number of cows that become pregnant, the payment to the workers remains constant.

Among the indirect production costs were identified costs for professional fees of the veterinarian, represented by the payments made to the veterinary engineer for each visit to the farm to ensure the conditioning of the heifers destined for pregnancy. This cost is variable, as its fees depend on the number of heifers delegated to it. Although not considered by the units studied, the depreciation of infrastructure, tools, machinery and equipment are included as indirect fixed costs.

Finally, since it is not under the control of the units, the commercialization and distribution cost center is not disaggregated; however, costs associated with the mobilization and transfer of specific products derived from the activity developed must be accumulated.

Based on the ideas outlined above, the implementation of a cost accumulation system specific to these production units becomes demanding, requires dedication and commitment. The

complexities of the production process of dual-purpose livestock farms require accounting and management adaptations that lead to the adoption of hybrid costing systems, consisting of the combination of two (2) systems of accumulation: a) by process and b) by activity, i. e. the cost criteria of both systems are needed to achieve a more accurate quantification. of the final costs arising from the process.

In the case of the application of the process costing system, the stages of the production process are considered as "cost centres"; that is, each stage will have the power to accumulate the costs resulting from the application of the inputs consumed by that stage. This consideration is shared by Polimeni et al. (2006), who attribute to this costing system the characteristic of accumulating costs through the establishment of cost centres.

In addition, the resources valued in the proposed costing system will be represented by the inventories of products in process, which, after the completion of the biological growth of the animal, will have allocated all the costs incurred for its development. In other words, inventories of products in process represent the accounting item that would allow the capitalization of resource costs charged to the herd of the farms.

The costs of "material inventories", which according to Muller (2007) represent the value of the resources to be used during the production process, will be distributed considering the inputs consumed by each stage. This criterion of the process costing system, according to Polimeni et al. (2006), is applied assuming that all stages do not require the same amount of inputs due to the specific nature of each. For example, some farms use "concentrated feeds" to supplement livestock nutrients. In the case of the rearing stage, the number of calves that develop there, would not consume the same amount of concentrated feed as the mautes that could be developed during the rearing stage.

The accumulation of costs considering the stages of raising the cattle takes into account the biological characteristics of the animal developed in this activity, where its optimal development, according to Parra and Prado (2012), is reached after approximately two (2) years. The process cost accumulation system allows the valuation of the "inventories in progress" that are generated during each biological stage of livestock, i. e. the costs accumulated at each stage (cost centres), which can then be attributed to the animals that are seasonally at that stage corresponding to their life cycle.

The costs of the number of calves that are in the rearing stage could be accumulated until they reach the maturity required to be called mautes, and the unit cost of the number of calves that are generated from the rearing stage could be determined. Similarly, it would be possible to determine the cumulative cost attributed to the steers during all their biological stages, after they have been generated by the raising stage.

In addition to the biological stages present in the production process of dual-purpose livestock systems, there is a stage whose share represents a significant portion of the costs of the final products, such as the feeding stage. According to Parra and Prado (2012), livestock farming, because it is a productive activity, where one of the main means of feeding cattle is "grazing", it is necessary to consider other elements that are not part of the animal's biological cycle.

The feeding of livestock through the generation of grass from the land is an activity that is carried out continuously throughout the production process, throughout the animal's entire biological cycle. For this reason, their costs are very difficult to identify, to then be attributed to the herd that is biologically going through the stages of the process. Given this characteristic of the proposed system, it is proposed to quantify the feeding stage through the system of accumulation of costs by activities, identifying allocation criteria for each of its categories (milk, pastures, supplements or concentrates).

In addition to feeding, other support activities are considered that could be quantified and accumulated through the activity-based costing system, identifying allocation bases for each, among which are animal health and zoo technical management.

Feeding costs will be allocated to the biological stages, according to the type of herd developed in each, using standardized criteria such as average pasture consumption per animal, i. e. it will be assumed that a calf consumes fewer kilograms of pasture per day than a maute, thus distributing the cost generated during the feeding stage among all the animals in the herd. considering the average consumption of each.

At the end of the life cycle of the livestock, i. e. once they can be called steers, the unit cost of each animal can be quantified by considering the costs accumulated on the animals during their transit through the growth stages. Once the cost per animal is obtained, it would make it easier for the producer to make decisions on farm operations.

Thus, at the end of the herd's biological cycle, a producer-manager would have at his disposal the cost of his "finished product inventories" represented by the steers available for sale. In this order of ideas, if the producer-manager decides to incorporate steers for the reproduction of the herd, or to incorporate heifers into the milking stage to produce milk after pregnancy, he would have the information to capitalize on the accumulated cost of the animals during their rearing, so that they can be incorporated into the property assets, plant and equipment of the farm, called in this case by their nature as biological assets (IAS 41).

As for the costs of depreciation and maintenance of biological assets (breeding bulls and milking cows), they would be charged to the cost of milk produced in the "milking stage" during its useful life. When cows or bulls are discarded for their benefit, i. e. destined for slaughter at the end of

their useful life, their cost would be represented by a ransom value, after the depreciation accumulated up to the date of their disincorporation from the production process has been charged to them.

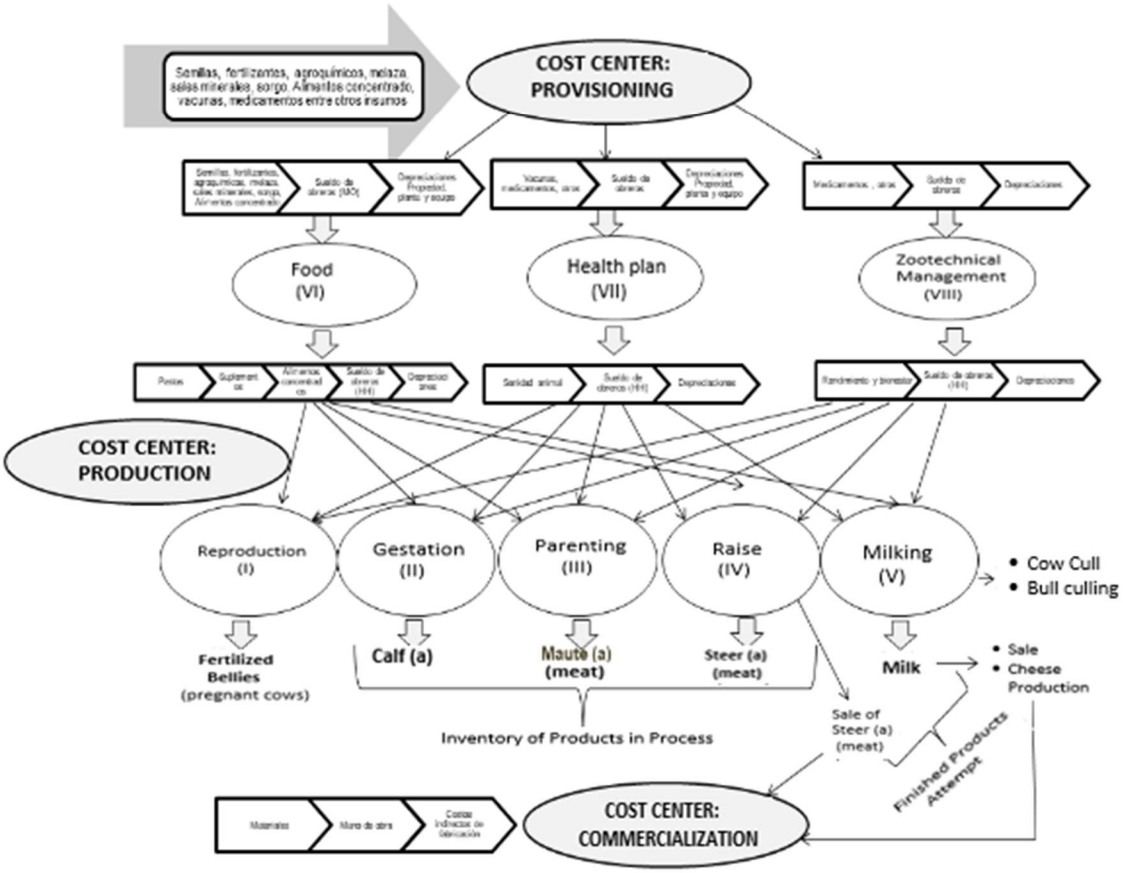
After these cost centres, the cost is apportioned to the by-products of each of the above-mentioned steps. (fertilized bellies, calves, mautes, steers, milk, meat. To these are added the marketing and distribution costs incurred in successive phases.
Based on the above ideas and considering the complexity of the production process of dual-purpose livestock systems, evidenced in previous results, it is concretized in the following methodological proposal, which, once implemented, will allow to obtain an approximation of the unit cost of the final products produced in the livestock sector (Diagram No. 7. 3), as well as constituting a support for the decision-making process at different stages of the livestock production process.

Cost management requires the adoption of systems and methodologies that guide the planning and control of expenditures incurred by the organization and are intended to generate future benefits. Organizations from various sectors of activity have adopted costing methodologies that allow them to support their production operations, however, not all manage to support their decision-making with the information offered by these systems; this is among other reasons due to the complexity associated with many of them, the lack of interest in their implementation, the demands they deserve or simply because they do not know the benefits they can offer once. adopted by companies.

For Chacón et al. (2006), changes in industrial production systems require detailed and flexible accounting for their internal operations. To do so, they use cost accounting as the backbone of management accounting. This presentation combines process theory with cost theory, from a simple and easily understandable perspective for those who will be the end users of this proposed cost information system (Diagram 7. 3)

Diagram No. 7. 3

Cost management in the agro-productive chain: Cost centres and sub-centres



Source: Own elaboration

4. Conclusions

The management of costs in the agro-production chain represents a challenge inherent to the management of small and medium-sized livestock farms and its consolidation constitutes a real challenge in the hands of the Venezuelan rancher-entrepreneur dedicated to the raising of dual-purpose cattle.

The implementation of the proposal involves the creation of a work culture that requires organization, disposition and commitment on the part of the producer. On them depends the success of a complex livestock activity full of experiences that, far from being transferred and documented, in many cases, are dispersed over time.

At the cost level, production processes must be organized and documented so that they become the basis for planning, control and operational decision-making, as well as facilitating the recording of production and accounting operations; recording, organizing, classifying and analysing accounting activities with a view to implementing simple cost information systems, within the framework of existing regulations and requirements in the country. environment. These will help to provide timely information on production operations, while helping to determine the real profitability of the sector and its activities.

The idea is to define cost items and concepts as well as their arrangement in a structure and continue to work on the design of cost structures according to the needs of the livestock sector. From the perspective of the proposal made, it is necessary to implement the management guidelines derived from this research, promoting their validation in a specific social reality. Its implementation requires changes in the administrative-accounting practices currently developed for the production units of the sector.

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