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Modeling of Livestock Production Activities and Cattle Marketing, A Decision-Making Model of Production and Sales Management

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ABSTRACT

Appropriate and accurate decision making is needed in every business activity. Farmers, collectors, and butchers at Slaughterhouses are the main actors in cattle production and marketing to final consumers. Modeling of cattle production activities to marketing helps the analysis and application of the right decision making. This research was conducted in Lolong Guba District, Buru Regency, Maluku Province, Indonesia, and will take place in 2021. The research aims to establish a model of cattle production and marketing activities. The research used a combination method, namely qualitative and quantitative methods. Qualitative methods were used to collect primary data information from cattle breeders, collector traders, and butchers at Slaughterhouses. Quantitative methods are used to record and make quantitative data from the informants. The resulting data will be used for model testing and simulation analysis in the future. The model formulated includes the variables of the amount of cattle produced by the breeder, the amount of production sold, the profit received by the farmer, the cost of production of the farmer, the value of cattle sales at the farmer level, the added value of cattle that are not sold, the price of kilograms of carcass at the farmer level, the value of the sale of cattle at the butcher's level, the profit received by the butcher, and the price per kilogram of carcass at the butcher's level. The model formed consists of 8 structural equations and 2 identity equations.

Keywords : Beef cattle breeders, Production, Marketing, Model, Decision making

I. INTRODUCTION

The fields of production and marketing are two important pillars of a business activity carried out by a businessman. The field of production is the space and center for the formation of production. In this field, new production units emerge and are produced. Production results from the use of various factors of production. In agriculture and animal husbandry, production is produced from various combinations of production factors including land, livestock and plant seeds, fertilizers, labor, supporting equipment, knowledge of farmers, and business capital (Le Gal, et al, 2011).

A well-organized production activity will have the potential and capacity to create large amounts of production in the future. Failure to design the production sector properly results in shackled production and the potential for emerging production. In the basic concept without considering other environmental factors, the success of creating more production units shows that the use of factors of production occurs intensively. This shows that the intensity of production factor management is well applied and efficiency occurs (Huq and Arshad, 2010; Gebregziabher, et al., 2012).

Management in production requires making decisions on certain measures of factors of production to be applied so as to produce maximum production. This management decision-making will be related to goals other than production including minimizing costs, profits to be obtained, the state of product demand in the market, prices per unit of production, and even other factors that are related to the field of production (Antle & Capalbo, 2001; Le Gal, et al, 2011). When a decision is made on the amount of production produced, it will be closely related to the decision on the number of factors of production used. These decisions are then considered and are based on the minimum cost as well as the greatest profit potential, even as a result of the use of more advanced technology (Devaraj, et al., 2007; Trentesaux, 2009).

Profit is an important indicator of a business activity. Profit is defined as the difference between receipts and expenses or expenses. The profit indicator is used as an indicator that business actors will be encouraged to work harder to produce more in the future. Thus the profit indicator provides useful motivation for business actors to further develop their business (Lowe, et al, 2020). The profit indicator also has meaning as an idea, namely how business actors focus their attention and focus on their business activities. In this case, profits encourage business actors to invest for future business development. Thus the certainty of receiving profits in business activities is widely useful in making decisions on business expansion (Shackle, 2017).

Marketing is the second important pillar after production in a business activity. Marketing is defined as the activities and processes for creating, communicating, delivering, and exchanging products from the producer side to the consumer side. The inability of production to reach the market will limit the distribution of the resulting product and result in production being piled up and unused by consumers. As a result, the excess production that accumulates causes the rate of production of new products to be stifled, and the consequences of using factors of production will also be depressed. Small-scale businesses that experience things like this will result in production activities not developing and businesses trapped in powerlessness to expand. This gives an indication that the marketing aspect is a determining factor for the success of a business activity (Rangaswamy, et al, 2020). Successful product marketing activities will support the creation of profit potential for business people.

Both business actors in the production sector as well as traders and market players require successful decision making in their respective activities so as to optimize the value or profit received. Success in decision making requires mastery in every aspect of the decision to be made. In this case, more accurate real-world information is needed to explain every process that occurs and is executed. Real world information can be captured well in a model. Therefore, a model is needed that can summarize the real world faced by each actor, both actors in the field of production and actors in the field of product marketing. Not limited to business people, the need for models is also needed by analysts and policy makers if business activities are related to the interests of the wider community (Vere and Griffith, 2004).

The model is defined as an abstraction of real world phenomena. The real world describes an economic or

other process, showing the interrelationships between the various variables included in the model. The relationship between variables shows a functional relationship between one variable and another, even the relationship between these variables takes place simultaneously. The relevant model is a model that is built based on the real world that occurs (Moosa, 2019).

An econometric model that is built relevant to the real world will be able to be used to simulate decision making in the analyzed process to obtain the right decision values (Antle & Capalbo, 2001). The model built will include a number of variables through which the available data can be analyzed and produce the required parameter values. Through model analysis, business actors and analysts can draw conclusions for decision making. The model can be used to simulate the dynamics of the existing variables in the future (Piger, 2009; Tedeschi, et al., 2011).

The second part of this paper describes the research method for model formation, the third part describes the specifications of the cattle production and marketing model, the fourth part is the discussion, and the fifth part is the conclusion.

II. MATERIALS AND METHODS

In order to build an econometric model in the production environment of cattle farmers and their marketing activities in the consumer end market space in an integrated manner, this study explores sources of information from various related actors. The research uses a combination method, namely qualitative and quantitative methods (Davies and Hughes, 2014). Qualitative methods are carried out through digging up all information regarding cattle rearing by farmers and tracking how live cattle products are marketed to the final market. Quantitative methods are carried out by collecting primary and secondary data from breeders, cattle collectors, butchers at Slaughterhouses (RPH), and field extension workers at the location of farmers.

The actors who raise and produce cattle for sale are the breeders. The actors who do the marketing of live cattle products to the final market are the traders who work together with the slaughterhouse butchers at the final market location. Information was also obtained from field extension workers who were tasked with educating cattle farmers and knowing accurately information on cattle rearing by farmers.

The research will take place in 2021. The location of the research sample is Lolong Guba District, Buru Regency, Maluku Province, Indonesia. Buru Regency, Maluku Province is one of the targeted districts for beef cattle development (Agricultural Research and Development Agency, 2020). Lolong Guba District was taken by purposive sampling, because it is the sub-district that has the second largest cattle population (4,048 heads) after Waelata District (5,792 heads) and is the sub-district with the most cattle sales (Central Bureau of Statistics of Buru Regency, 2021).

For the establishment of a beef cattle production and marketing model, data and information collected from farmers, collector traders, and butchers include: (1) the number of cattle kept, (2) the number of cattle production, (3) the amount of production sold, (4) the amount of forage provided, (5) labor services for taking care of cattle, (6) the cost of production of the breeder, (7) the price and value of the farmer's agreement when the cattle are sold to the collectors, (8) the estimated added value of the cattle that have not been sold, (9) price per kg of carcass at the slaughterhouse level according to the estimated weight of carcass per head at the final market, (10) transportation costs for collectors buying cattle from the farm to the slaughterhouse, (11) selling value of cattle collectors to slaughterhouses at slaughterhouses, (12) sales value of slaughter cattle to the final market, (13) estimated body weight of cattle sold by butchers (including meat, bones, offal, skin), (14) butcher's

production costs, (15) cattle farmer's profit, (16) profit butcher, and (17) price per kg beef at retail level.

The data and information needed above were obtained through in-depth interviews and detailed recording of the informants. Through the analysis of the collected data, an econometric model is formed that integrates the condition of the farmer to the state of the final beef market.

III. MODEL SPECIFICATION RESULTS

In conceptual form, the model built for beef cattle production and marketing is expressed in the following verbal and mathematical models.

a. The equation for the number of cattle produced by farmers is defined as the number of cattle produced by farmers during maintenance until now, expressed in live weight. The number of breeders' cattle production depends on the large number of breeders' pet cattle that have developed following the length of maintenance time. The longer the maintenance time, the more cattle the farmer has. The amount of production also depends on the amount of forage given to livestock. The amount of forage consumed by livestock is estimated based on live weight of livestock, which is 10% of body weight (Qomariyah, et al. 2020). Forage for cattle is available naturally on the farmer's land so that the cattle are only grazed onto the land for grazing and supervised by the farmer. The workers who take care of the cows are family workers so there is no hired labor. Estimates of the cost of fodder (forage) and family labor are carried out implicitly according to values and prices relevant to the conditions of local farmers. The number of cattle breeders currently produce is always related to the amount prepared by farmers to be sold when the cows reach the age of 3 years. The equation for the number of cattle breeders is:

QSp = f (KPtr, JlMak, QSelPtr) …… (1)

b. The equation for the number of cattle sold shows the number of cattle sold in one year by farmers. The number of cattle sold is an estimate of the carcass weight of cattle by both breeders and collectors when making transactions. Usually, farmers estimate the carcass weight of cattle to be slightly higher, while collectors estimate the carcass weight to be slightly lower with the aim of making a profit if sold in the final market. The amount of production sold depends on the success or failure of the farmers' bargaining position in determining their estimated carcass weight and being accepted by collectors. The number of cattle production sold also depends on the number of breeders' pet cattle that have developed following the length of time they are kept. It also depends on the estimated price per kg of beef (carcass) that is relevant at the farmer level, and depends on the estimated profit that the farmer can receive. The equation for the number of cows sold by farmers is:

QSelPtr = f (BBSpPtr, KPtr, PEstPsr, LabPtr) (2)

c. The farmer's profit is determined as an identity equation, indicating the amount of profit received by the farmer from the number of cattle kept. Profit is calculated from the sum of the added value of livestock that have not been sold at this time plus the value/price of livestock that have been successfully sold minus the amount of production costs incurred. The added value is the estimated value of live cattle according to age and body weight according to the value that is acceptable to farmers in their village environment. The selling value/price of the cattle breeders shows the selling value of the cattle as agreed by the breeders and collectors when the transaction takes place. Meanwhile, the farmer's production cost is the total expenditure in raising cattle for a year. The identity of the farmer's profit is:

LabPtr = NTPtr + NSelPtr – CostPtr … (3)

d. The farmer's production cost equation shows the estimated cost of raising livestock for a year which includes forage costs and the value of family labor services. Production costs dynamically depend on the number of cattle farmers produce, and the amount of forage given to cattle. The amount of forage given to livestock is estimated according to the intensity of the number of cattle prepared for sale in the future. If cows are intended to be sold with high body weight, the intensity of forage is higher, which results in the provision of more forage. The equation for farmer production costs is:

CostPtr = f (QSp, JlMak) ……. (4)

e. The equation for the value (total) of selling cattle to farmers is the selling value of the cattle at the time of the transaction. The selling value of cattle depends on the amount of production of cattle sold, the price per kg estimated by the collectors and agreed by the farmer, and the estimated profit that will be received at the slaughterhouse level. The number of cattle sales and the price per kg of cattle are the same as the previous definition. Butcher's profit shows the amount of profit received by butchers at the Slaughterhouse location which is estimated based on sales of meat, bones, offal, and skin. The equation for the value/selling price of cattle breeders is:

NSelPtr = f (QSelPtr, PEstPsr, LabPjl) ... (5)

f. The value-added equation for cattle is the estimated value of live cattle according to the age of the cow and body weight according to the value that is acceptable to farmers in their village environment. The added value of cattle owned by farmers depends on the number of cows produced, as well as the estimated price per kg live weight of the cow. Cattle that have not been sold or are kept by farmers as seeds and are still in the process of fattening have different weights according to their respective ages. The value-added equation for cattle breeders is:

NTPtr = f (QSp, PRatBH) …… (6)

g. The equation of the selling price per kg of cattle at the farmer level is the price per kg of beef agreed upon between the collectors and the breeders during the transaction. The price per kg of cattle depends on the estimated profit that will be received by the farmer, the estimated profit received by the butcher in the final market environment, and the value of the sale of cattle production by the butcher in the Slaughterhouse environment. The price per kg of cattle at the farmer level is of course agreed upon by the breeders and collectors within the breeder's environment, but the collecting traders take into account that the agreed price must be acceptable to the butchers at the Slaughterhouse level. If the price of the agreement with the farmer is not pushed lower, then there is an opportunity for the butcher to reject the price of the cow offered by the collecting trader. The equation for selling price per kg of cattle at the farmer level is:

PEstPsr = f (LabPtr, LabPjl, QSelPjl) ….. (7)

h. The equation for the sale value of beef production at the butcher level is the price per head of cattle which is calculated based on the estimated amount of meat, bones, offal, and skin sold according to the price of each product component. Butchers will sell meat, bones, offal, and skins to retailers so that all parts of the product are calculated in value as the final result of selling one cow. The sale value of slaughter cattle depends on the estimated weight of the cow's carcass along with the estimated weight of bones, offal, and skin that can be produced from a cow. The sale value of slaughter cattle also depends on the average estimated price per kg of cattle (carcass plus parts

of offal, bones, and skins), also depends on the estimated profit received by the butcher from the sale of a cow. The equation for the sale value of cattle at the butcher's level is:

QSelPjl = f (BTksPsr, PEstPjl, LabPjl) …. (8)

i. The butcher's profit is defined as the identity equation, indicating the amount of profit received by the butcher from the number of cattle sold. Profit is calculated from the sales value of the slaughterer's production minus the costs incurred by the butcher in the production and sale of cattle. Butcher production costs include the cost of purchasing cows from collecting traders, the cost of food during the cow quarantine, and the cost of local taxes. The identity of the butcher's profit is:

LabPjl = QSelPjl - CostPjl ……..…… (9)

j. The equation of the selling price per kg of beef at the butcher level is the estimated price per kg of beef butchers at the final market level. The price per kg of cattle at the butcher level depends on the estimated profit to be received by the butchers and the price per kg of cattle at the retail level in the final market. Generally, the price per kg of cattle at the retailer level is higher so the butcher sets the price per kg of cattle to the retailer following the selling price level that will be set to the consumer. The equation for the selling price per kg of cattle at the butcher level is:

PEstPjl = f (LabPjl, PEcer) ……... (10)

Description of the variables in the above model are:

QSp = Total production of cattle breeders according to body weight (Kg)

QSelPtr = Amount of production sold according to the estimated and agreed weight collectors and breeders at the time of transaction (Kg)

LabPtr = Farmer's profit (added value + selling value - production cost) (Rp)

CostPtr = Farmer's production cost (food cost and labor value) (Rp)

NSelPtr = Selling value of cattle at farmer level (Rp/head)

NTPtr = Value added from cattle that are not sold (Rp)

PEStPsr = Price per kg of carcass at farmer level estimated by traders collectors according to market prices and agreed by farmers (Rp/Kg)

QSelPjl = Sales value of slaughter cattle at Slaughterhouse (Rp)

LabPjl = Profit received by butchers (Rp)

PEStPjl = Price per kg of cattle estimated by butchers according to final market price (Rp/Kg)

KPtr = Number of cattle breeders as capital that develops according to time maintenance (Tail)

JlMak = The amount of grass provided for cows is estimated according to 10% by weight body of each tail (Kg)

BBSpPtr= The estimated body weight of the cow (total) of the farmer based on the number of production sold (Kg)

PRatBH= Estimated price for live weight of cattle (average Rp/Kg)

BTksPsr= Estimated selling weight of beef (total: meat, bones, offal, skin) (Kg)

CostPjl = Production cost of butchers (cost of buying cows, food, etc.) (Rp)

PEcer = Price per kg of cattle at retail level in the final market (Rp/Kg).

IV. DISCUSSION

Following the verbal and mathematical models above, the model formed can explain behavior in decision-making regarding the scope of cattle production activities and the scope of cattle marketing from the farmer level to the final market. The structural

equation formed will explain the behavior of the actors in deciding the magnitude of the observed and taken variables depending on how strong the influence of the determining variable is. Structural equation has the meaning as an equation that shows the functional relationship between the variables it includes (Nachtigall, et al. 2003).

The structural equation of the number of breeders' production explains the capacity of the breeder to produce a number of cows over several years of rearing. During the maintenance period, cattle can increase both the number of heads and body weight. Therefore, the production of cattle breeders can be measured in the form of accumulated body weight of all existing tails. A production function is determined by the factors of production of capital, labor, and other factors of production (Epple, et al. 2010). Cattle are cattle that are slow to breed, that is, one parent can give birth to one tail in a year. This happens if the parent is fertile enough and successfully mated with a male. Often marriages with males give unsuccessful results. The main obstacle for breeders in this research location is having a small number of female parents, generally only one tail. Meanwhile, the use of males to mate with females is done by hiring males from other breeders.

The constraints faced by these breeders have caused the growth rate of the number of cattle to run slowly. Generally, farmers need about 3 years to get one adult cow that is ready to be sold. Thus, if the breeding of cattle breeders is slow, the opportunity for farmers to sell cattle cannot be done freely. This condition makes it possible to define the number of cows owned by the farmer as a capital variable that develops according to the length of maintenance time. The ownership of the farmer's land area should be able to function as a capital production factor, but the function of the land in the farmer's environment is freely available and does not limit the opportunities for raising cattle. The function of free land like this cannot be a determining factor for how much cattle breeders produce.

Another production factor that determines the opportunity for the number of cattle breeders to produce is the availability of forage. The amount of cattle production measured in terms of body weight is closely related to the intensity of forage provision to livestock. Cattle that are intensively grazed in the field will consume enough forage so that it provides a large enough weight gain for the livestock. This will contribute to the production of cattle produced by farmers. The production factor of labor to take care of livestock in the breeder's environment, comes from family labor and only requires the amount of one person. This is the reason for not specifying labor as a production factor that affects the production of cattle breeders.

Another variable that is formed as a determining factor for the number of cattle breeders is market attractiveness. Market attractiveness indicator is defined as the amount of production that farmers can sell. The number of cattle that were successfully sold became a pull factor for farmers to increase their production in the future. Cattle farmers will be motivated to increase their production after successfully selling a number of cattle that are currently available. All of the reasons above support the strengthening of the formulation of the structural equation for the amount of livestock production as a function of live cattle capital, the amount of forage provided, and the amount of production sold by farmers.

The equation for the number of cattle sold explains the capacity of farmers to realize cattle sales within a year. Generally, cattle sales occur in the size of the tail, but the farmers in the study area are not based on the number of heads but the estimated carcass weight. Collectors who come to buy cows at the farmer's location and resell them to the butchers at the Slaughterhouse at the final market location estimate the number of carcasses that can be obtained from the

purchase of a cow. This estimate must contain the potential profit to be received. According to the estimates of the collectors, the farmers participate in assessing the carcass weight of their cattle when negotiating the sale transaction takes place. Breeders estimate carcass weight slightly higher according to their experience, while collectors estimate carcass weight slightly lower. The success of breeders in convincing collectors to accept their estimated carcass weights demonstrates the strength of their bargaining power.

Based on the estimated carcass weight, the total production of cattle sold is measured based on the agreed total carcass weight (kg/head) between the farmer and the collector during the transaction. The realization of the farmer to sell a certain number of cattle will refer to the estimated potential weight of all the cattle of the breeder at this time which will be a sales guide for the coming year. If the total body weight of the breeder's cows is large enough (according to the number of heads, age, and body weight), it will open up opportunities for the next sale. In line with the estimated weight of the cow, the number of cows as capital that develops also becomes relevant in determining the amount of production sales.

The price factor per kg of cattle at the time of sale is the next determinant. The amount of the price is an indicator of the potential profit achieved by farmers. If the farmer manages to negotiate a slightly higher price per kg, they will receive a high and potentially profitable sale. Another determinant of the number of cattle sold by farmers is the estimation of the amount of profit that will be received. The price factor per kg carcass is already an indication, but involving the amount of profit is important to convert the amount of costs and services for breeder maintenance. In this case the farmer considers a commensurate conversion in return for their services in maintenance and management. Farmer management includes the intensity of setting the time for grazing cattle, the services of workers serving and maintaining livestock, and setting the target for achieving the desired cattle body weight. These factors are measured in terms of value added and production costs.

The production cost equation explains the cost of raising livestock. Cost includes all expenditures in maintenance operations, both explicit and implicit expenditures. Functionally the amount of production will be tied to the use of variable inputs so that the input value remains negligible. In the environment of cattle breeders, the production factor that determines the achievement of the amount of production is the amount of forage provided for livestock. While the factor of family labor with a fixed amount does not functionally cause major changes in the production of livestock body weight. Therefore, in the measurement of costs, the labor factor is not included as a determining factor for costs. The only factor determining production costs associated with the amount of livestock produced is forage. Farmers in rural areas do not have the availability of other production factors such as concentrates, vitamins, and other supplement materials. Breeders only rely on forage as the main feed ingredient.

The equation of selling value per head and total cattle at the farmer level explains their bargaining power in maintaining the acceptable value of livestock. Cattle are a valuable asset in the family of farmers and are often used as capital in planning the construction and repair of residential houses, children's marriages in the future, financing for children's further education, plans to travel abroad, even as savings that can be used at any time. for sale. All of these considerations serve as the basis for establishing a fair value for the sale of a cow.

The selling value of cattle will be in line with the amount of body weight as a production attached to cattle. Also the selling price of cattle is in line with the price per kg of carcass weight at the farmer level, and the attractiveness of the profit that will be received by the butcher in the final market. Even

though the selling value of a cow is carried out at the farmer level, collector traders are very intensive in haggling over the value of the cow with the farmer during the transaction. Collecting traders consider the amount of profit that the butcher should receive later in the final market. If the estimated butcher's profit is getting smaller, then the collecting traders are not willing to accept the high price offer of cattle from the farmer. Therefore, the selling price of cattle at the farmer level has a functional relationship with the opportunity for profit at the butcher level.

The equation of selling price per kg of carcass at the farmer level explains the pricing behavior in the farmer environment. Breeders are not dominant in determining the price of this carcass because traders also want to fight for their interests, namely negotiating lower prices. The farmer considers the price per kg of carcass to be comparable to the estimated price generally applicable in the farmer's area. Meanwhile, collectors consider the price per kg of carcass to refer to the final market.

At the farmer level, the selling price per kg of carcass is linked to the estimated profit he will receive. Because there is a negotiation between collecting traders who consider the profit for the butcher, the selling price per kg of carcass is determined by the potential profit to be received by the butcher and also by the sales value of the slaughterer's production which includes carcass, bones, offal, and skin.

The sales value equation for slaughter cattle production explains the value of a cow in transactions at the butcher level. Butchers buy cows from traders, then slaughter the cows and sell them in production components in the form of carcasses, offal, bones, and skins. All these production components are sold to retailers, then retailers will sell to the final consumer market. The carcass weight of the butcher's agreement when transacting with collecting traders is only an estimate. Meanwhile, after slaughtering the cow and selling it in production components, the butcher will get a definite amount of each component. In this case the butcher can ascertain the realizable value received from the sale.

Thus, the sales value of slaughter cattle will be related to the accumulated weight of the estimated carcass, offal, bone, and skin obtained, and is also closely related to the price per kg of each production component produced. Another thing that is also related to the sale value of slaughter cattle is the calculation of the profit to be received. The butcher's profit will be converted according to the costs incurred during the cow quarantine to slaughter and the fixed burden of the animal slaughter tax to the local government.

The equation of selling price per kg of cattle at butcher level explains the price transmission between butchers and retailers. The location of the slaughterhouse at the Slaughterhouse is so close to the final market that the butcher knows the exact price per kg of carcass and other components. Thus, the price per kg of carcass and other components will be determined by the butcher following the price of each component at the retail level.

The increasing demand for meat by consumers in the market causes the market price to be quite high. This opportunity is exploited by traders and butchers seeking to purchase cattle from farmers more intensively. The increasing demand for beef by the community is caused by higher population growth, increased public awareness of nutrition, and improved purchasing power (Melsasail, 2019).

V. CONCLUSION

This research has formulated a model for decision making regarding cattle production and marketing activities. Cattle breeders in Lolong Guba Subdistrict, Buru Regency, Maluku Province and traders, as well as butchers are actors in cattle production and marketing activities who struggle to produce cattle and deliver them to consumers. The formulated

model helps actors to make the best decisions successfully.

The model formulated includes decision variables including: (1) the amount of cattle produced by the breeder, (2) the amount of production sold, (3) the profit received by the farmer, (4) the cost of production of the breeder, (5) the value of cattle sales at the farmer level. , (6) the added value of cattle that are not sold, (7) the price of kilograms of carcass at the farmer level, (8) the sale value of cattle at the slaughterhouse level, (9) the profit received by the butchers, (10) the price per kg of carcass at the butcher level. The model formed consists of 8 structural equations and 2 identity equations. Structural equations explain the behavior of determining the number of cows produced, the amount of production sold, the production costs of farmers, the value of cattle sales for farmers, the added value of livestock, the price per kg of carcass at the farmer level, the sales value of cattle at the butcher level, and the carcass price at the butcher level. The identity equation calculates the profit values of farmers and butchers in accounting. Models of cattle production for breeders and marketing can be used for simulation analysis in order to make detailed decisions.

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