

## Development of Dairy Farming of a Rural Family Property through the Budget Management

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### Abstract

*This article proposes to analyze the development of dairy farming in a family farm through budget management. The research data were collected on a rural property located in the south of Santa Catarina, Brazil, in the period from July 2020 to June 2021. The research results evidence that the rural property obtained, as a result of dairy farming, an operating result with a profitability of 63.77% of total revenue. Based on a projection of organic growth of the dairy herd in interaction of proposed improvement actions, it is estimated growth of the operating result representing profitability of 79.02% of total revenue. It is concluded that budget management can help in decision making regarding the development of dairy farming, as well as monitoring the implementation of improvements in the dairy production process.*

**Keywords:** Budget System. Agribusiness. Milk. Livestock.

### 1. Introduction

Dairy production occupies a relevant space in the Brazilian agricultural sector. According to the Food and Agriculture Organization of the United Nations (FAO, 2019), Brazil ranks third in the dairy production ranking, behind only the United States and India (Rocha & Carvalho & Resende, 2020). According to IBGE (2020), Brazilian milk production in 2019 reached the mark of 3.8 billion liters, an increase of 2.7% compared to 2018.

Friedrich and Rutsatz (2015) state that most rural properties in Brazil are made up of groups of families who, through their daily work, derive their livelihood from dairy production. Braum and Martini (2013) evidence that rural producers usually focus on the productivity of their activity and are unaware of production costs and expenses. However, when there is poor management of dairy production costs, there is a risk that the property will generate operating losses. Therefore, it is important for the producer to manage his costs so that he can continue producing and obtain better profitability. According to Brina, Picolo and Watanabe (2021), the price in the dairy market varies frequently and this requires rural producers to manage their production unit, controlling the costs and results of their rural property, especially when the price of milk decline and concomitant increase in input costs. The budget is used in institutions, regardless of their size, serving as guidance for decision-making, making it possible to achieve operational result objectives defined in the budget process. The income budget provides a comparison of the data performed by the company with the data defined in the budget, enabling to have a parameter for decision-making, and monitoring of possible unforeseen events and macroeconomic crises (Bilk, Silva; Lavarda, 2021; Hopwood, 2009).

Based on Souza (2014), budget is an instrument that reproduces business planning, through actions that guide the framing of financial resources. For Hoji (2017) the financial system or system is used through financial planning that demonstrates the economic and financial performance of the company.

For Braga (1995), the budget system must include the company's development and the results it wants to achieve. Still for Braga (1995) budgeting is not just control and forecast but requires analysis of the past history and estimation of probable and desired future operations.

The budget process, according to Souza (2014), is composed of three phases: elaboration, execution and monitoring. In the elaboration phase, a period is determined and data is collected for the elaboration of the company's operational and financial budget spreadsheets. In the execution phase, everything that was foreseen in the elaboration phase is put into practice. Monitoring is the phase that the actual values are compared with the predicted values.

In this sense, this article aims to analysis the development of dairy farming in a family farm through budget management. In this way, it helps to demonstrate to dairy producers how it is possible to manage their production unit through budget management. For Brina, Picolo and Watanabe (2018) it is possible to implement the budget to monitor the development of dairy farming, since the growth of the producing herd can be predicted and managed. Therefore, it is possible to periodically monitor the efficiency of the dairy production unit and decide on possible corrective actions in case of deviation from the operating result.

This study consists of four sections. In the subsequent section the methodological procedures are approached, in the third section it presents and discusses the research results. Finally, the fourth section ends the article with final considerations.

## 2. Methodological Procedures

The present study took place in a milk production unit located in the south of Santa Catarina, Brazil, with an extension of 27 hectares where 5.7 hectares are destined for milk production and the rest is used in the production of rice and corn. The owners entered the dairy industry in 2018, starting with the production of cheeses, however, the activity ended as the operating result was not satisfactory. Thus, in the second half of 2018, the producer intensified the production and marketing of milk, buying the necessary equipment stimulated by better profitability. Currently, the property has been growing, with successive genetic improvement of its herd and consequent quality of milk for commercialization. The property has a physical structure in good condition, with safe and standardized equipment and facilities, enjoying the quality of its matrices and the milk produced.

The research design, in terms of investigation purposes, is descriptive, aiming to present the financial behavior of the rural property under study, as a function of the milk production operation. And as for the means of investigation, it is documentary, with data collected from records (Hair et al., 2010) from July 2020 to June 2021 obtained from payment receipts from the production unit, including: milk sales, fees, animal feed, medicines, electricity, among other operating expenses. Thus, the numbers analyzed were the result of posting in an electronic spreadsheet for further quantitative analysis of the data (Creswell, 2013).

## 3. Presentation and Discussion of Results

### 3.1. Characterization of the property and the squad

The rural property under study maintains the feeding of its dairy herd through the semi-intensive system. This system allows the cattle to spend most of their time free in the pastures, and at the end of the day they are collected for milking and receive supplementation in their food through silage, cassava dough and concentrated rations that helped to increase production of milk. Table 1 shows the herd composition for the period. In the last month studied, the property has a herd of eleven (11) animals and has five (5) sows in full lactation, comprising the breeds: Holstein Jersey, Swiss Brown and Jersey. Dry cows are at the end of gestation, awaiting the next reproductive cycle for milk production, and heifers are destined for the future increase of the milk production herd.

Table 1: Herd composition

Indicators	Average	July/20	Aug/20	Sep/20	Oct/20	Nov/20	Dec/20	Jan/21	Feb/21	Mar/21	Apr/21	May/21	June/21
Lactating cows	5.08	5	6	4	4	6	4	4	6	6	6	5	5
Dry cows	0.92	1	0	2	2	0	2	2	0	0	0	1	1
Heifers	3.58	2	2	2	2	3	3	4	5	5	5	5	5
<b>Total</b>	<b>9.58</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>

Source: research data.

Complementary operating income from the sale of milk comes from the sale of animals, including calves and cows, which at the end of their production cycle do not produce milk. The property does not have a bull for reproduction and thus artificial insemination is used with the advantage of defining the sex, contributing at that moment with the reproduction of calves for the maintenance and organic increase of the herd of lactating cows.

### 3.2 Income statement of the exercise.

From the survey of operating income and expenses, it was necessary to analyze the Income Statement for the Year, described in table 2.

Table 2: Income statement

	Total	Average	%	July/20	Aug/20	Sept/20	Oct/20	Nov/20	Dec/20	Jan/21	Feb/21	Mar/21	Apr/21	May/21	June/21
<b>Operating income</b>	<b>65,028.81</b>	<b>5,419.07</b>	<b>100.00</b>	<b>4,714.86</b>	<b>4,546.56</b>	<b>5,874.26</b>	<b>5,989.86</b>	<b>5,016.16</b>	<b>5,276.35</b>	<b>6,064.14</b>	<b>5,707.48</b>	<b>3,877.77</b>	<b>6,511.96</b>	<b>5,566.05</b>	<b>5,883.36</b>
Revenue from the sell of milk	61,028.81	5,085.73	93.85	3,714.86	4,546.56	4,874.26	5,989.86	5,016.16	4,276.35	6,064.14	5,707.48	3,877.77	5,511.96	5,566.05	5,883.36
Revenue from the sell of animals	4,000.00	333.33	6.15	1,000.00	0.00	1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	1,000.00	0.00	0.00
Rate	701.84	58.49	1.08	42.72	52.29	56.05	68.88	57.69	49.18	69.74	65.64	44.59	63.39	64.01	67.66
<b>Net Revenue</b>	<b>64,326.97</b>	<b>5,360.58</b>	<b>98.92</b>	<b>4,672.14</b>	<b>4,494.27</b>	<b>5,818.21</b>	<b>5,920.98</b>	<b>4,958.47</b>	<b>5,227.17</b>	<b>5,994.40</b>	<b>5,641.84</b>	<b>3,833.18</b>	<b>6,448.57</b>	<b>5,502.04</b>	<b>5,815.70</b>

<b>Operational expenses</b>	<b>22,860.75</b>	<b>1,905.06</b>	<b>35.15</b>	<b>1,437.07</b>	<b>1,422.45</b>	<b>1,819.25</b>	<b>2,122.61</b>	<b>1,749.41</b>	<b>1,847.52</b>	<b>1,772.06</b>	<b>2,311.36</b>	<b>2,054.72</b>	<b>2,570.70</b>	<b>1,994.39</b>	<b>1,759.21</b>
Animal feed	12,900.00	1,075.00	19.84	1,050.00	1,050.00	1,050.00	1,050.00	1,050.00	1,050.00	1,100.00	1,100.00	1,100.00	1,100.00	1,100.00	1,100.00
Cassava dough	1,954.00	162.83	3.00	0.00	0.00	369.00	304.00	427.00	0.00	0.00	368.00	0.00	486.00	0.00	0.00
Medicines	1,764.06	147.01	2.71	0.00	120.00	130.95	177.00	0.00	162.00	169.00	263.00	249.00	228.00	150.11	115.00
Pasture reform	1,598.00	133.17	2.46	0.00	0.00	0.00	312.00	0.00	0.00	0.00	289.00	0.00	538.00	459.00	0.00
Cleaning and maintenance	1,425.35	118.78	2.19	268.00	60.00	125.00	60.00	125.00	60.00	278.00	60.00	125.00	60.00	135.00	69.35
Silage	1,142.30	95.19	1.76	0.00	0.00	0.00	0.00	0.00	389.00	0.00	0.00	423.00	0.00	0.00	330.30
Electricity	968.99	80.75	1.49	75.80	73.45	74.30	80.05	77.41	80.70	89.66	86.36	87.72	88.70	80.28	74.56
Mineral supplement	785.40	65.45	1.21	0.00	70.00	70.00	70.00	70.00	70.00	85.40	70.00	70.00	70.00	70.00	70.00
Veterinarian	322.65	26.89	0.50	43.27	49.00	0.00	69.56	0.00	35.82	50.00	75.00	0.00	0.00	0.00	0.00

<b>Operational result</b>	<b>41,466.22</b>	<b>3,455.52</b>	<b>63.77</b>	<b>3,235.07</b>	<b>3,071.82</b>	<b>3,998.96</b>	<b>3,798.37</b>	<b>3,209.06</b>	<b>3,379.65</b>	<b>4,222.34</b>	<b>3,330.48</b>	<b>1,778.46</b>	<b>3,877.87</b>	<b>3,507.65</b>	<b>4,056.49</b>
Profitability (%)	63.77			68.61	67.56	68.08	63.41	63.97	64.05	69.63	58.35	45.86	59.55	63.02	68.95

Source:

The average monthly operating revenue in the period under analysis was R\$5,419.07, comprising the sum of revenue from milk sales R\$5,085.73 and animal sales R\$333.33. In the analyzed period, there was no loss of animals, being subtracted from the operating income from the sale of milk and animals, only the value of Funrural taxes. Thus, the average monthly net revenue is R\$5,360.58. Subtracting operating expenses in the average amount of R\$1,905.06, the average monthly operating result was R\$3,455.52 with profitability of 63.77% of total revenue. Even though not all cows were lactating, the factors that influenced profitability were sales price and milk productivity.

It is observed that the lowest operating result was obtained in March 2021. On the other hand, January 2021 reached the highest result of the analyzed period, being mainly impacted by operating revenue.

The pregnant heifers will enter lactation in the future and represent the organic growth of the herd of lactating cows and consequent increase in milk production with a probable increase in operating income, supposing minimally the maintenance of the milk price. In order to estimate the future operating result, a projection of the organic growth of the squad was made in table 3, which compares the average value of the composition of the squad carried out in the studied period (July/2020 to June/2021) with the projected average of the squad for the next twelve (12) months (July/2021 to June/2022).

Table 3: Income statement versus budgeted

Indicators	Realized Average (July/2020 to June/2021)	Budgeted Average (July/2021 to June/2022)
Lactating cows	5.08	6.75
Dry cows	0.92	1.75
Heifers	3.58	3.50
<b>Total</b>	<b>9.58</b>	<b>12.00</b>

Source: research data.

In table 4, the Income Statement of the exercise projected for the next twelve (12) months (July/2021 to June/2022) was prepared, due to the estimated organic growth of the squad, as well as actions to reduce operating expenses to purposes of comparison with the Income Statement carried out in the period from July/2020 to June/2021.

Table 4: Budgeted income statement

	Realized (July/2020 to June/2021)			Budgeted (July/2021 to June/2022)		
	Total	Average	%	Total	Average	%
<b>Operating income</b>	<b>65,028.81</b>	<b>5,419.07</b>	<b>100.00</b>	<b>95,318.10</b>	<b>7,943.18</b>	<b>100.00</b>
Revenue from the sell of milk	61,028.81	5,085.73	93.85	95,318.10	7,943.18	100.00
Revenue from the sell of animals	4,000.00	333.33	6.15	0.00	0.00	0.00
Rate	701.84	58.49	1.08	701.83	58.49	0.74
<b>Net Revenue</b>	<b>64,326.97</b>	<b>5,360.58</b>	<b>98.92</b>	<b>94,616.27</b>	<b>7,884.69</b>	<b>99.26</b>
<b>Operational expenses</b>	<b>22,860.75</b>	<b>1,905.06</b>	<b>35.15</b>	<b>19,294.95</b>	<b>1,607.91</b>	<b>20.24</b>
Animal feed	12,900.00	1,075.00	19.84	12,000.00	1,000.00	12.59
Cassava dough	1,954.00	162.83	3.00	1,954.00	162.83	2.05
Medicines	1,764.06	147.01	2.71	1,110.95	92.58	1.17
Pasture reform	1,598.00	133.17	2.46	600.00	50.00	0.63
Cleaning and maintenance	1,425.35	118.78	2.19	1,110.00	92.50	1.16
Silage	1,142.30	95.19	1.76	600.00	50.00	0.63
Electricity	968.99	80.75	1.49	960.00	80.00	1.01
Mineral supplement	785.40	65.45	1.21	840.00	70.00	0.88
Veterinarian	322.65	26.89	0.50	120.00	10.00	0.13
<b>Operational result</b>	<b>41,466.22</b>	<b>3,455.52</b>	<b>63.77</b>	<b>75,321.32</b>	<b>6,276.78</b>	<b>79.02</b>

Source: research data.

Based on the estimate, it is expected that in the projected period the property under study will reach an operating result of R\$75,321.32. In addition to revenue growth, factors expected to influence the operating result, due to the drop in operating expenses, are the supply of feed at a lower price, as well as the production of feed on the property. Reform and increase of pastures will also be carried out, adding quality of milk as well as reducing expenses with animal feed. A reduction in expenses with medicines and veterinarian is expected, since in the year under study, there were extra expenses that normally do not occur. In addition, milk productivity can be influenced by the genetic improvement of your herd through artificial insemination.

#### 4. Final Considerations

The property analyzed, based on the present research, can verify its operational result, as well as consider possible improvements in the production unit and analyze its possible impact on the operational result.

Therefore, it is recommended that the dairy producer monitors operating income and operating expenses periodically in order to monitor the operating result. It is possible to make budget projections in order to simulate possible future scenarios, thus contributing to decision making regarding possible improvements in the production process.

It is recommended that the rural manager make a comparison between the realized operational result and the projected budget in order to carry out possible corrective actions and qualify future budgets. With this study it is possible to verify that the rural manager can develop dairy farming through budget management, bringing benefits contributing to the economic sustainability of the family rural property.

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