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RETURN ON INVESTMENT AND THE IMPACT OF THE COST OF LABOR ABOUT MILK PRODUCTION: AN ECONOMIC RESEARCH TO ESPIGÃO DO OESTE CITY– STATE OF RONDÔNIA, BRAZIL

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ABSTRACT

The objective of this work was to identify the return on investment and the impact of the cost of labor in milk production . Being evidenced the production costs with and without labor. The study was carried out with the ten largest producers of milk, linked to Rural Producers Association of the Rio Claro (APRURIC, municipality of Espigão do Oeste – State of Rondônia. An interview was performed with the producers to obtain information about each farm property, this way, it was found that among the studied properties only a system of paddock and uses improved genetic pattern through artificial insemination

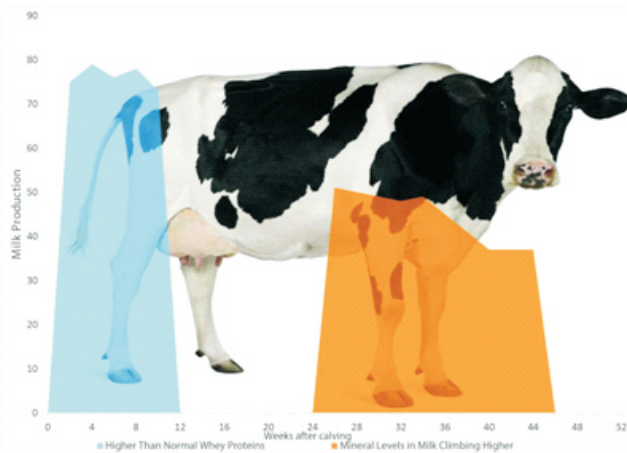


with semen of animals with higher potential yield, thus contributing directly to raise the levels of productivity of lactating's cows. However, it was done the survey of income and costs with and without labor inherent in each property. In relation to the amount of litres milked every month, there was an average 3,983.5 litres. The cost of labor for producers was between USD\$ 127.40 and USD\$ 382.20 monthly. In this sense, the average monthly cost with the production was of R\$ 1,467.79 without labor. To be considered the cost of labor, the average monthly cost was USD \$ 733.37. Thus, in relation to the revenue obtained in that study period was USD\$ 777.53 on net. It was found that only one property obtained injury in the period, with loss of USD\$ - 0.0022

per litre, to be disregarded to labor. However, among the properties, was found an annual average of 11.63% of return on the capital invested in the milk production.

KEYWORDS: Milk Production, Costs, Labour, Return on investment.

INTRODUCTION



The effort to organize and manage the profits is a challenge for many rural producers, who for a long time are looking for tools to organize efficiently their riches, but the accounting allows you to get control of rural business on the basis of information on the situation of rural property, thus allowing the rural producer exceeds limits, not limited to only produce, in this sense, on the basis of information, seek to understand, manage and deploy technologies in their properties is large or small, to the facilitation of everyday rural business tasks (ULRICH, 2009).

Due to the great influence that the milk production exerts on the family income, the producer seeks alternatives to a higher milk production per day within the rural properties (OLIVEIRA et al. 2001). In this sense, the milk's activity is of paramount importance in Brazilian agribusiness, because there are a large number of farmers in this milk production process, generating new jobs, and providing continuous income to a lot of families, since in the moment of the production process in the field, until the industrialization of the product. The milk production gives to cattle breeder the formation a fast flow of capital, thus avoiding the migration of people from rural areas to urban centres, both through income generation to families and its importance at the Brazilian level (ALEIXO, SOUZA and FERRAUDO, 2007).

In this way, the dairy livestock account with important factors for maximising the production of milk, being the principal the relation of the number of cows milked, because the higher the number, the higher too the chance of getting the desired increase in the production of milk, and to achieve this increase in milk production, it is necessary for the deployment of these factors, because with this milk production will reach major proportions, thereby maximizing the daily production that becomes more efficient to the extent that investments are being made in support of this objective, resulting, however, in a more productive advantage in relation to other family producers (Brazilian Company of Agricultural Research – EMBRAPA, 2012).

Considering also that landowners seek greater control in their business, and are looking for tools and technologies that allow for a higher milk production, the profitability is considered as a natural criterion, in that it is responsible for demonstrating to stakeholders the information relevant to the return that was obtained through the investment made by the producer. In the face of the importance of rural accounting and the profitability index, to subsidize decisions, this research aims to approach characteristics of dairy farming, demonstrating its revenues, costs in general, making a comparison between the costs with and without labor, thus demonstrating the impact causing when included this cost in the dairy farming, this way, sought to highlight the investments made by producers, so that evidences the return that the ranchers have obtained in a given moment of time, since the

greater the satisfaction of the man in the field, the greater their attachment to the rural area, ensuring income in many families, both directly, or indirectly.

Thus, the research was carried in March 2015, in an rural association in José Fernandes roadway section, in which contains 43 (forty-three) associated with, and only 35 (thirty-five) attend in the association. With this, this research was carried out with the 10 (ten) major producers of milk, where it was used a semi-structured interview with 56 (fifty-six) questions for producers the search target, aiming to address issues concerning the practices used by them in a way that allowed the characterization as to the extent of the properties, the size of the cattle herd, the revenue obtained during the period studied, the unit costs and total inherent in production, as well as investments in function of the milk activity. In this sense, the present study aimed to identify the return on investment and the impact of labor costs in this activity properties linked to Rio Claro's Rural Producers Association (APRURIC), located in the municipality of Espigão do Oeste –State of Rondônia (RO). Therefore, we attempted to identify the volume of production and the value obtained by the sale of the product; the costs of milk production; cost of labor involved in the activity, as well as identify how long does it take to be the return on investment in the dairy production.

DAIRY PRODUCTION

The dairy farming is the main activity performed by cattle ranchers. In addition, the essentiality of the milk production stands out by high nutritional value that the food offers and especially by their contribution to the income of thousands of families in Brazil (CREPALDI, 1998; GOMES 1999).

Zoccal, Alves and Gasques (2011) also claim that the technological innovations are applied in dairy activities can contribute to transforming the production systems, making with that are able to increase the productivity of milk and thus generating a greater capacity of competitiveness with other producers in the dairy market. The importance of extending the productivity of milk is due to the fact that, up to the year 2050, it is envisaged that the world market food is expected to grow at a rate of up to 100%, and to meet the demand of this reality next, it is necessary that the challenges that prevent maximization of production to be overcome, because the researchers authors also emphasize that the Brazil offers available technologies for greater competitiveness, some of the barriers that Brazil faces for a greater demand are: quality of milk produced, productivity per area and per animal, among an others problems.

In Brazil about 930,000 milk producers sell the product. The Brazilian livestock account with approximately 209,541,109 cattle, where this number, on average 22,924,914 are milked cows, which produce about 30,715,460 litres of milk, corresponding to 1,340 litres of milk per cow milk a year (EMBRAPA, 2012).



According to reported data by the IBGE (2013) about the production of milk, Brazil is in a considerable growth since 1974, in the third quarter of 2013, for example, the milk production in the country, has reached a volume of 5,964,704 litres of milk, which were acquired and processed by industries for the consumption of the population.

The the brazilian dairy production is marked by two characteristics, first that the production occurs in the whole brazilian territory and second that the milk production in the country is heterogeneous, i.e. the ranchers don't use a standard system of milk production, this fact of diversity

occurs in all states in Brazil. The diversity is characterized, for example, in daily milk production. While some ranchers small cattle raisers has milked approximately 10litres per day, others producers have advanced technological resources, they cannot overcome the volume of 60,000 litres milked per day (ZOCCAL, ALVES, GASQUES, 2011).

By Making a comparison of milk production between the regions of the Brazil, it should be noted that the Northern region was the only one that has maintained its growth over the past five years, where he was registered an increase of 1.3 %, although its growth between the years of 2011 and 2012 was gradually lower comparing with other previous periods (IBGE, 2012).

DAIRY FARMING IN RONDONIA STATE (BRAZIL)

The dairy farming is considered a sector of paramount importance for the agribusiness in State of Rondonia, being responsible for generating income for many families in family farming, and serving as an important supplement to feed several families in the state, Brazil and whole world. The state relies on a herd of cattle with approximately 12.2 million head, representing 57% of the national herd, being responsible for the seventh largest herd of Brazil and second largest of the northern region (SEPLAN, 2013).

The State of Rondonia has still a high production of milk, where the daily production of the state is approximately 2.5 million litres and a volume of 76 million litres per month. In the state 80% of the milk producers are considered as small, and the milk activity exerts great influence on economic life of many families. It can be stated that there are approximately 13.4 lactating cows in each property this unit of the brazilian federation, occurring mainly in small properties. Rondonia has a significant participation in food production, especially when it comes to the production of milk, which is characterized as one of more developed activities, highlighting the dairy livestock by relevant growth which he has acquired over the last few years (Agency of Sanitary Defense Agrosilvopastoril of State of Rondonia IDARON, 2013).

Based on data from the Brazilian Institute of Geography and Statistics (IBGE), Rondonia is in constant growth, in a comparison of changes in the State in milk production, within a period of 30 years, Rondônia came out of a production level of 824,000 litres of milk in 1976 and went on to produce approximately 615,562 litres of milk. Rondonia occupies the 9th position in the ranking of the national production of milk, if highlighting for this reason, the state has approximately 12 million cattle and buffalo, and the state being responsible for occupy the seventh largest herd of Brazil (IBGE 2006).

In the year 2011, the Gross Domestic Product (GDP) of the State of Rondonia, 2011 was USD\$ 6,960 million dollars, the state occupies the 21th (twenty-first) position in relation to the largest GDP of the Brazil, being classified as the third highest in the northern region, where the livestock activities accounted for 10.8% of GDP participation with this number (SEPLAN, 2013).

LIVESTOCK IN ESPIGÃO DO OESTE

According to data from the IDARON (2014) the municipality of Espigão do Oeste there is a total of approximately 3,190 rural properties, which include approximately 384,678 cattle. After data collection, the IDARON noted that the municipality has gone from 365,659 cattle in the month of April 2014 to 384,678 of livestock, in November 2014, showing an increase of 5.20% in his flock.

Still according to the IDARON (2013) the municipality of Espigão do Oeste is among the 10 largest milk producers to State, even as the data, the institute says that the biggest producers are responsible for approximately 40% of the whole production of the State of Rondônia. Espigão do Oeste has a daily production of approximately 80,477 litres of milk that are obtained through by milking mad

mainly by family farmers.

AGGREGATION OF MILK PRODUCTION ON FAMILY FARMING

With the continuous growth of the population, the food offered by nature, without human intervention, it was not enough to meet the needs of all society, because this appears the agriculture as a source of maximization of food resources to supply the demand for food (OLIVEIRA et al., 2011).

The term family agriculture highlights important aspects, such as: the family, the job, the production and the cultural traditions. In Brazil the family agriculture plays an extremely important role in agricultural production. With this Family farmers are considered the owners of rural establishments, which in addition to fulfilling the role of owner, assumes all commitment to work in your establishment productive, i.e. all workforce is coming from the family. These producers are usually people who get low education level, and seek to take advantage of the resources that their properties have as a source of income (EMBRAPA, 2005).

According to Altafin et al. (2011) the production of milk is present in approximately 1.8 million rural properties, and family farming is present in at least 80% of these family properties. The authors also emphasize that the milk is responsible for the stability of the families that use this activity by means of production, because the cattle represents a kind of savings for the small producers, as they are through the cattle that originates the income of many families, being that this income can be obtained in several ways, both through the sale of fresh milk, as in the sale of milk derivatives, or even sale of animals, which are considered by ranchers as a booking of resources.

The family production is present in several properties in Brazil and has important role in the economy of small cities in the interior of the country, because they generate many jobs in the field and in the city, in shops, and also various services that are provided, is responsible for part of the food security of the country.

The agriculture is of higher importance in the whole national territory, because they exert an important position in exports by Brazil, thereby participating directly in the sector of the Brazilian economy. In this sense, the family agriculture stands out by being responsible for more than 40% of the gross value of agricultural production, where responsible for the majority of existing food on the table for millions of Brazilians, and still contribute with 74% of manpower in rural establishments existing in every nation. In Rondonia milk production stands out among the activities performed by family farmers. The state has major role in agribusiness milk, because it has registered a significant growth in recent years, so that he could be considered one of the main producers in Brazil (OLIVEIRA et al., 2010).

MATERIALS AND METHODS

Whereas the proposed objectives, this research consists of an applied research, because it aimed to learn about the practices used by producers, as well as the costs incurred in each property, thus to find the feedback obtained by the investments.

The research was classified as field, exploratory and descriptive. For its implementation was done a survey to 10 largest milk producers belonging to APRURIC, Espigão do Oeste. The data were obtained by means of an interview with the producers, using a structured roadmap containing 56 (fifty six) issues.

For data analysis it was made a categorization of information and according to their similarities, these were condensed and analysed with the aid of statistics electronic tools, and subsequently presented in the form of graphs and tables for a better understanding of the data, because, according to Gil (2010) the use of statistics electronic tools can be used to analyse large and small samples. Also was

used bibliographic material to aid the analysis and demonstration of the results obtained by the survey.

RESULTS AND DISCUSSION

Characterization of rural properties according this research

It was found that 80% of the properties surveyed practice only the dairy activity and the other 20% complement the activity with the beef cattle, confirming this way which says Crepaldi (1998) which ensures that in this sense, in Brazil there are two categories: beef and dairy cattle, and the dairy activity considered the main, followed the practice of cutting where occurs the creates, recreates and fattening for sale as beef cattle. Already Altafin et al (2011) points out that the production of milk is present in approximately 1.8 million rural properties milk is responsible for the stability of the families that use this activity by means of production, because the cattle represents a kind of savings for the small producers, as they are through the cattle that originates the income of many families, being that this income can be obtained in several ways, both through the sale of raw milk, as in the sale of milk derivatives, or even sale of animals, which are considered by ranchers as a booking of resources.

In relation to the size of the properties, they vary greatly in their size, being between 29.28 and 292.80 hectares (ha) . The property that has less area in pasture, has 58% of its total area in pasture and has more is all in pasture, i.e. 100% of the area is formed in pasture, as shown by Table 01.

Table 01: Relationship between the size of property and amount of grass.

	The Property Size (ha)	Quantity in pasture (ha)	Pasture %
Property 01	36.60	29.28	80
Property 02	195.20	195.20	100
Property 03	36.60	29.28	80
Property 04	51.24	39.04	76.19
Property 05	29.28	19.52	66.6
Property 06	292.80	170.80	58.33
Property 07	48.80	43.92	90
Property 08	170.80	117.12	68.57
Property 09	61.00	41.48	68
Property 10	122.00	97.60	80

Source: Data from the survey (2015).

The dairy production varies from 80 to 200litres/day, being that all the labor used for these properties is exclusively family, ranging from 02 and 03 people involved in milk activity daily. With this, the rural properties are administered by their respective owners, and the daily activities are maintained and performed by the family. This way the EMBRAPA (2005) ensures that family farmers are considered the owners of rural establishments, which in addition to fulfilling the role of owner, assumes all commitment to work in your establishment productive, i.e. all workforce is coming from the family. These producers, are usually people who get an low level education, and seek to take advantage of the resources that their properties have as a source of income.

During the month of March 2015, the 10 properties target the study had a total of 263 lactating cows that produced together approximately 39,725litres of milk, resulting in a daily average of 5.035 litres/cow. It is noteworthy that the average production per cow/day is between 3.857 litres/cow/day, this being the lowest average observed, already in another property was verified a greater media/cow of 8.571 l/cow/day. Before this, it was found that in Rondonia around 80% of the milk producers are considered small, obtaining in each property approximately 13.4 cows in lactation, which together nonbreastfed an average of 2.5 million litres /day, resulting in a volume of average production in

Rondonia 76 million litres a month.

It is worth pointing out that the milk production per cow is directly related to the breed of the animal, because the property has the highest average daily production per cow, the predominant race of the flock is Holsteins or Holstein Frisian. On the other hand, the property that is the smaller average milk production per cow/day the predominant race is the Tabapuã or Ortenblad.

The Brazilian Association of Cattle Breeders of Holstein (2015), highlights that the breed is characterized by its longevity of productive efficiency and resistance to diseases, being this reason considered as advantage over other breeds milk, leading some producers to give preference to its race in the training of their dairy stock.

DEPRECIATION OF ASSETS

To get to know the cost of depreciation of cows and oxen for each property, was considered to be the average value of purchase, and the average value of sales at the time of disposal of each animal, as can be seen in Table 02.

Table 02: Value of acquisition and disposal of cows and breeding animals.

Identification	Cows			Ox		
	Lactating cows (fx)	Value Acquisition (USD \$)	Value of sales (USD \$)	Quantity of oxen (fx)	Value Acquisition (USD \$)	Value of sales (USD \$)
Property 01	22	750	300	01	1,250	625
Property 02	17	625	300	07	1,500	750
Property 03	24	625	325	01	1,250	625
Property 04	14	625	300	01	1,250	625
Property 05	15	625	300	01	750	375
Property 06	35	575	275	02	1,500	750
Property 07	25	625	300	02	1,000	500
Property 08	35	625	300	02	1,500	750
Property 09	26	625	300	02	1,250	575
Property 10	50	625	300	02	1,250	575

Source: Data from the survey (2015).

It is worth noting that in the case of cows, these have a useful life of 09 years, thus the value of acquisition of each cow, as the survey is between USD\$ 575.00 and USD \$ 750.00, thus respectively in properties 01 and 06, in the other properties, the acquisition value is predominantly USD\$ 625.00. Already in relation to the value of sale of each cow, was found a default value between the properties of USD\$ 300.00, with the exception of properties 03 and 06 that discard their cows on average value of USD\$ 325.00 and USD\$ 275.00, in this order, as shown in Table 02. Yet, considering the depreciation, in relation to the breeding of each property, it was found that the mean values of acquisition of breeding animals are between USD\$ 750.00 and USD\$ 375.00, and that after its useful life of 08 (eight) years, the value of disposal of animals vary between USD\$ 375.00 and USD\$ 750.00, data as passed on by the owners.

With this, to determine the depreciable value of monthly matrices and breeding, was used the acquisition value minus the value of discard (sale), dividing this total by life of animals and multiplying this by the total number of lactating cows in that period, as previously mentioned, reaching to the values presented in Table 03.

Table 03: Cost with monthly depreciation of cows and breeding animalso

Identification	Cow Depreciation (USD \$/month)	Ox Depreciation (USD \$/month)
Property 01	91,67	6,51
Property 02	51,16	54,69
Property 03	66,67	6,51
Property 04	42,13	6,51
Property 05	45,14	3,91
Property 06	97,22	7,81
Property 07	75,23	5,21
Property 08	105,33	15,63
Property 09	78,24	14,06
Property 10	150,46	7,03

Source: Data from the survey (2015).

Among the properties surveyed, only 03 of them have only one breeder in the property, the other units have between 02 and 07 breeders, being the largest number on the property 02 which all were used to copulation of cows in that period, justifying the high value of monthly depreciation, for the purposes of calculating the depreciable value of the oxen, was used the average value between all breeders,

In relation to the properties 08 and 09, these used 02 oxen as breeders in that period of study, the other were used only 01 (a) breeder. However, in relation to the race of the flock of breeding animals, was found in the presence of Girolando cattle in 70% of the properties related to the Association.

Whereas the management carried out in rural entities, it was evident that the producers still perform milking manually, using the labor force of the family, because, according to research, only 30% of studied producers have mechanical milking, as a tool to facilitate the management. As for the cooler, 60% of the properties have the equipment, as shown in Table 04 :

Table 04: Depreciation of Refrigerator and Mechanical Milking

Dairy Farms	Refrigerator		Mechanical Milking	
	Value Acquisition (USD \$)	Monthly Depreciation (USD \$/month)	Value Acquisition (USD \$)	Monthly Depreciation (USD \$/month)
Property 01	3,500.00	29,17	1,750.00	14.58
Property 05	3,675.00	30,63	-	-
Property 06	3,000.00	25,00	-	-
Property 07	3,000.00	25,00	1,500.00	12.50
Property 09	4,200.00	35,00	-	-
Property 10	3,500.00	29,17	1,750.00	14.58

Source: Data from the survey (2015).

For the purposes of calculating depreciation of equipment demonstrated, was used to table available at the site of Federal Revenue of Brazil, which sets out a useful life of 10 years for each of the elements presented. With this, we used the value of acquisition by multiplying this way by depreciation rate of 10% per year by dividing this by 12 months of the year.

In this sense, the property 01 offers a system of paddock, however, the value of the investment was USD\$ 7,500.00, which in practice has a lifetime average of 20 years, will erode this way 5% per year, in this sense, the system in question depression USD\$ 125.00 per month. Even in relation to this

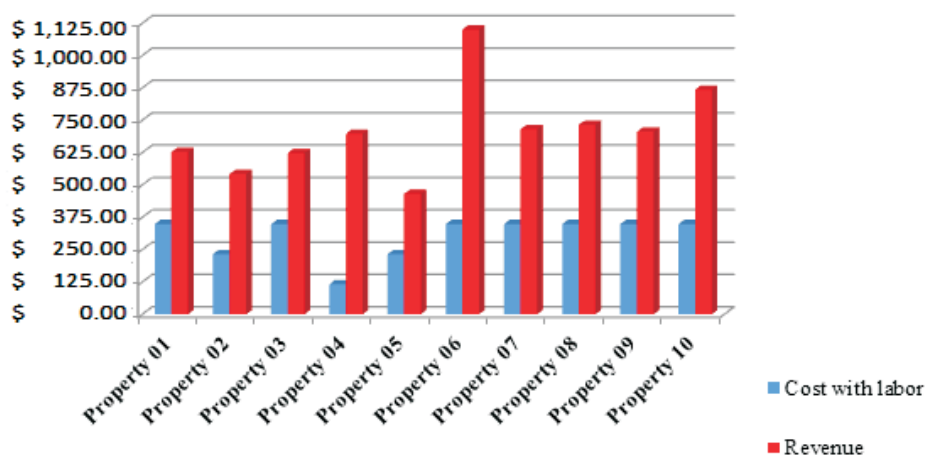
property, the same uses the practice of genetic improvement of the flock through artificial insemination, with this investment in canister semen was USD\$ 400.00, which in practice has a useful life of 20 years, depreciating this way around USD\$ 1.67 monthly.

LABOR COSTS

To calculate the cost of labor, it was used the value of daily practiced in the region, which was found a value of USD\$15.00 /day/worked, however, this value was divided by the day of 08 hours worked daily, and thus the value of USD\$ 1,88/hour/day/worked. However, in order to ascertain the cost of labor, was considered to be the value of the hours worked per day, multiplied the number of people involved in dairy farming, and for hours worked daily for each individual property, arriving in this way the value per day worked, by multiplying the value obtained by 31 days equivalent to the month of March, which were carried out the work forces.

Below the figure 01 shows the relationship between revenue and costs with labor for a greater understanding of the data.

Figure 01: Relationship between the revenue and the cost of labor.



Source: Data from the survey (2015).

In this context, figure 01 shows that the property 04 had the lowest labor in that period, however observing the properties 02 and 05 we note that both have the same cost with labor, and the rest of the properties responsible for the largest value of this cost.

COST OF PRODUCTION IN EACH PROPERTY

After the collection and demonstration of expenses with depreciation and labor involved in the production of milk, and analyzed the information obtained, calculations were carried out to find the cost of production of each litre of milk, however, were established costs with and without labor, thus demonstrating the feasibility of strength of family work, in relation to energy costs, these were only inherent to the properties that have mechanical milking or refrigerator. This way there is the table 01:

Table 01: Cost of production in each property

Costs with labor		Costs without labor	
Property 01	Total (USD \$)	Property 01	Total (USD \$)
Labor	348.75	Energy	13.75
Energy	13.75	Supply	82.50
Supply	82.50	Medicines	18.75
Medicines	18.75	Supplements	50.00
Supplements	50.00	Nitrogen	6.75
Nitrogen	6.75	Depreciation	174.85
Depreciation	174.85	-	0.00
Total	695.35	Total	346.60
FUNRURAL	14.90	FUNRURAL	14.90
TOTAL after the FUNRURAL	710.25	TOTAL after the FUNRURAL	364.00
Monthly Production	3,410 litres	Monthly Production	3,410 litres
Costs monthly Totals	710.25	Costs monthly Totals	361.50
Unit Cost including FUNRURAL	0.21	Unit Cost including FUNRURAL	0.11
Sale Price	0.19	Sale Price	0.19
Profit/Loss/Liter	-0.02	Profit/Loss/Liter	0.08
Profit/loss for the Period	-62.35	Profit/loss for the Period	286.40
Property 02	Total (USD \$)	Property 02	Total (USD \$)
Labor	232.50	Supply	63.75
Supply	63.75	Medicines	53.82
Medicines	53.82	Supplements	312.50
Supplements	312.50	Depreciation	105.85
Depreciation	105.85	-	0.00
Total	768.35	Total	535.85
FUNRURAL	12.48	FUNRURAL	12.48
TOTAL after the FUNRURAL	780.82	TOTAL after the FUNRURAL	548.32
Monthly Production	3,100Litres	Monthly Production	3,100 Litres
Costs monthly Totals	780.82	Costs monthly Totals	548.32
Unit Cost including FUNRURAL	0.25	Unit Cost including FUNRURAL	0.18
Sale Price	0.18	Sale Price	0.18
Profit/Loss/Liter	-0.08	Profit/Loss/Liter	0.00
Profit/loss for the Period	-238.32	Profit/loss for the Period	-5.82
Property 03	Total (USD \$)	Property 03	Total (USD \$)
Labor	348.75	Supply	90.00
Supply	90.00	Medicines	12.50
Medicines	12.50	Supplements	37.50
Supplements	37.50	Depreciation	73.18
Depreciation	73.18	-	0.00
Total	561.93	Total	213.18

FUNRURAL	14.33	FUNRURAL	14.33
TOTAL after the FUNRURAL	576.26	TOTAL after the FUNRURAL	227.51
Monthly Production	3,720 litres	Monthly Production	3,720 litres
Costs monthly Totals	576.26	Costs monthly Totals	227.51
Unit Cost including FUNRURAL	0.16	Unit Cost including FUNRURAL	0.06
Sale Price	0.17	Sale Price	0.17
Profit/Loss/Liter	0.01	Profit/Loss/Liter	0.11
Profit/loss Period	46.84	Profit/loss Period	395.59
Property 04	Total (USD \$)	Property 04	Total (USD \$)
Labor	116.25	Supply	52.50
Supply	52.50	Medicines	77.08
Medicines	77.08	Supplements	50.00
Supplements	50.00	Depreciation	48.64
Depreciation	48.64	-	0.00
Total	344.47	Total	228.22
FUNRURAL	16.04	FUNRURAL	16.04
TOTAL after the FUNRURAL	360.52	TOTAL after the FUNRURAL	244.27
Monthly Production	3,720 litres	Monthly Production	3,720 litres
Costs monthly Totals	360.52	Costs monthly Totals	244.27
Unit Cost including FUNRURAL	0.10	Unit Cost including FUNRURAL	0.07
Sale Price	0.19	Sale Price	0.19
Profit/Loss/Liter	0.09	Profit/Loss/Liter	0.12
Profit/loss Period	336.99	Profit/loss Period	453.24
Property 05	Total (USD \$)	Property 05	Total (USD \$)
Labor	232.50	Energy	10.00
Energy	10.00	Supply	56.25
Supply	56.25	Medicines	60.42
Medicines	60.42	Supplements	41.67
Supplements	41.67	Depreciation	79.67
Depreciation	79.67	-	0.00
Total	480.50	Total	248.00
FUNRURAL	10.70	FUNRURAL	10.70
TOTAL after the FUNRURAL	491.20	TOTAL after the FUNRURAL	258.70
Monthly Production	2,480 litres	Monthly Production	2,480 litres
Costs monthly Totals	491.20	Costs monthly Totals	258.70
Unit Cost including FUNRURAL	0.20	Unit Cost including FUNRURAL	0.10
Sale Price	0.19	Sale Price	0.19
Profit/Loss/Liter	-0.01	Profit/Loss/Liter	0.08
Profit/loss Period	-26.20	Profit/loss Period	206.30
Property 06	Total (USD \$)	Property 06	Total (USD \$)

Labor	348,75	Energy	8.75
Energy	8.75	Supply	131.25
Supply	131.25	Medicines	62.50
Medicines	62.50	Supplements	20.83
Supplements	20.83	Depreciation	130.04
Depreciation	130.04	-	0.00
Total	702.12	Total	353.37
FUNRURAL	25.31	FUNRURAL	25.31
TOTAL after the FUNRURAL	727.35	TOTAL after the FUNRURAL	378.60
Monthly Production	6,200 litres	Monthly Production	6,200 litres
Costs monthly Totals	727.35	Costs monthly Totals	378.60
Unit Cost including FUNRURAL	0.12	Unit Cost including FUNRURAL	0.06
Sale Price	0.18	Sale Price	0.18
Profit/Loss/Liter	0.06	Profit/Loss/Liter	0.12
Profit/loss Period	373.15	Profit/loss Period	721.90
Property 07	Total (USD \$)	Property 07	Total (USD \$)
Labor	348.75	Energy	12.00
Energy	12.00	Supply	93.75
Supply	93.75	Medicines	20.83
Medicines	20.83	Supplements	200.00
Supplements	200.00	Depreciation	117.94
Depreciation	117.94	-	0.00
Total	793.27	Total	444.52
FUNRURAL	16.45	FUNRURAL	16.45
TOTAL after the FUNRURAL	809.73	TOTAL after the FUNRURAL	460.98
Monthly Production	4,030 litres	Monthly Production	4,030 litres
Costs monthly Totals	809.73	Costs monthly Totals	460.98
Unit Cost including FUNRURAL	0.20	Unit Cost including FUNRURAL	0.11
Sale Price	0.18	Sale Price	0.18
Profit/Loss/Liter	-0.02	Profit/Loss/Liter	0.06
Profit/loss Period	-94.40	Profit/loss Period	254.35
Property 08	Total (USD \$)	Property 08	Total (USD \$)
Labor	34.75	Supply	131.25
Supply	131.25	Medicines	89.58
Medicines	89.58	Supplements	93.75
Supplements	93.75	Depreciation	120.95
Depreciation	120.95	-	0.00
Total	784.28	Total	435.53
FUNRURAL	16.85	FUNRURAL	16.85
TOTAL after the FUNRURAL	801.13	TOTAL after the FUNRURAL	452.38
Monthly Production	4,185 litres	Monthly Production	4,185 litres
Costs monthly Totals	801.13	Costs monthly Totals	452.38
Unit Cost including FUNRURAL	0.19	Unit Cost including FUNRURAL	0.11
Sale Price	0.18	Sale Price	0.18
Profit/Loss/Liter	-0.02	Profit/Loss/Liter	0.07
Profit/loss Period	-68.75	Profit/loss Period	280.00
Property 09	Total (USD \$)	Property 09	Total (USD \$)

Labor	348.75	Energy	14.50
Energy	14.50	Supply	97.50
Supply	97.50	Medicines	41.75
Medicines	41.75	Supplements	83.25
Supplements	83.25	Depreciation	127.30
Depreciation	127.30	-	0.00
Total	713.05	Total	364.30
FUNRURAL	16.22	FUNRURAL	16.22
TOTAL after the FUNRURAL	729.27	TOTAL after the FUNRURAL	380.52
Monthly Production	4,030 litres	Monthly Production	4,030 litres
Costs monthly Totals	729.27	Costs monthly Totals	380.52
Unit Cost including FUNRURAL	0.18	Unit Cost including FUNRURAL	0.09
Sale Price	0.18	Sale Price	0.18
Profit/Loss/Liter	-0.01	Profit/Loss/Liter	0.08
Profit/loss Period	-24.03	Profit/loss Period	324.73
Property 10	Total (USD \$)	Property 10	Total (USD \$)
Labor	348.75	Energy	13.25
Energy	13.25	Supply	187.50
Supply	187.50	Medicines	31.25
Medicines	31.25	Supplements	66.67
Supplements	66.67	Depreciation	201.25
Depreciation	201.25	-	0.00
Total	848.66	Total	499.91
FUNRURAL	19.97	FUNRURAL	19.97
TOTAL after the FUNRURAL	868.63	TOTAL after the FUNRURAL	519.88
Monthly Production	4,960 litres	Monthly Production	4,960 litres
Costs monthly Totals	868.63	Costs monthly Totals	519.88
Unit Cost including FUNRURAL	0.18	Unit Cost including FUNRURAL	0.10
Sale Price	0.18	Sale Price	0.18
Profit/Loss/Liter	0.00	Profit/Loss/Liter	0.07
Profit/loss Period	-0.63	Profit/loss Period	348.13

Source: Data from the survey (2015).

Whereas the calculations with unit cost per liter of milk sold, the same was discharged rate and the value of total cost/month by production of litres monthly, which resulted in unit cost for each property.

To ascertain the profits of the period among the properties studied, it was noticed that even excluding labor costs, only the property 02 (two) obtained an injury, which costs represented 102,33% of revenue, i.e. , obtained a loss of USD\$ 5.82 during the period. However, with the injury found in property 02, it was noted that the negative result is given by the following factors: increase with cost with salt, cost with vitamin and cost with depreciation of the oxen, because as had been observed with the data's survey, the costs of this property were relatively higher than the other properties.

Analysis of monthly production of milk at studied properties, it had noticed that the dairy production in that region is heterogeneous. Among the studied properties it was found that only one uses the system of paddock as a tool to maximize the dairy production, on the other hand 30% of the properties surveyed seek a management by technology, they are using mechanical milking as a tool to

reduce the use of daily labor, in other cases, the properties have only the cooling machine to make the product with a higher quality. In this sense, the practices observed in the properties studied confirm what Zoccal, Alves, Gasques (2011) emphasized. Because the authors found that the dairy farming is characterized by its heterogeneity in all national territory in Brazil, because the ranchers do not use a standard system of milk production.

REVENUE

In another way, considering the revenue obtained by the properties studied in the month of March 2015, Table 05 shows the amount received by each property during the period.

Table 05: Revenue obtained

Identification	Average milked (litres/month)	Value received (USD \$ / litre)	Average Revenue (USD \$)
Property 01	3,410	0.19	647.90
Property 02	3,100	0.18	542.50
Property 03	3,720	0.17	623.10
Property 04	3,720	0.19	697.50
Property 05	2,480	0.19	465.00
Property 06	6,200	0.18	1.100.50
Property 07	4,030	0.18	715.33
Property 08	4,185	0.18	732.38
Property 09	4,030	0.18	705.25
Property 10	4,960	0.18	868.00

Source: data from the survey (2015).

In this way, firstly it was extracted information about revenue, by calculating the average of litres milked per day, multiplied by 31 days equivalent to the month of March, which was carried out the research, whereas the milk activity is performed every day of the month. In this sense, it has increased the amount of litres milked monthly with the value of each litre sold, which on this value affects the sales tax, which is discounted 2.3% of revenues for the Fund of Assistance to Rural Producer (FUNRURAL).

In analysis of 10 (ten) properties surveyed, there is only one that has a paddocks system, where the pasture is irrigated and fertilized, increase the efficiency in production. In this case, due to the pasture differentiated proportionate to flock, a dairy product paid for this property an additional value of USD\$ 0.01 cents per litre of milk sold, this fact is the result of an improvement in the quality of product in relation to the other properties, which is caused by the power supply separate from the flock.

The management factor was also a relevant point in the differential paid per litre of milk in this property, because due to the care of hygiene in milking, was added a value of USD\$ 0.003 per litre sold, it is worth noting that due to this fact, the property in question receives certificate of quality monthly, becoming a reference in that Association. Considering the whole exposed above that, Zoccal, Alves and Gasques (2011) ensure that the metric technological innovations that are applied in dairy activities, these can contribute to change the production systems, thus generating a higher productivity of milk, thus a big capacity of competitiveness with other existing producers in the milk market.

In relation to the differentiation in selling price per litre of milk of other properties, these values vary according to the price paid by a dairy product in sale of the primary product.

TOTAL COST

After the calculation of revenue, were analysed the cost of products sold for each property, which includes information about the cost of food, energy, medicine, labor, supplementation, genetics and depreciations, being the same with cooler, mechanical milking, oxen and cows. Table 06 below shows the relative value to the cost of each property:

Tabela06: Representativeness of the costs in relation to the revenue (including cost of labor)

Identification	Operating Revenues (USD \$)	Cost of Goods Sold (USD \$)	%
Property 01	647,90	695,60	107,32
Property 02	542,50	768,35	141,63
Property 03	623,10	561,93	90,18
Property 04	697,50	344,47	49,39
Property 05	465,00	480,50	103,33
Property 06	1100,50	702,12	63,80
Property 07	715,33	793,27	110,90
Property 08	732,38	784,28	107,09
Property 09	705,25	713,05	101,11
Property 10	868,00	298,66	97,77

Source: data from the survey (2015).

As shown in table 06, the values of cost of products sold were relatively high, which resulted in injury in 60% to the properties, this fact is due to the value of labor, which was between USD\$ 116.25 and USD\$ 348.75, thus justifying the injury found in each properties.

However it should be noted that the cost of labor in the production of milk is characterized as the remuneration of the producer with the activity on the property, since they use family labor to meet their daily activities so that the production of milk is only feasible with family labor, because according to the calculations presented above, in some cases the costs of the service of milk reached about 55% (fifty-five) the revenues obtained in that month.

For a better understanding of the fact that one outlined above, were calculated based on the cost of goods sold excluding labor costs, in this way, it should be noted that 100% of properties sources of study yielded a profit in their production, as shown in Table 07.

Table 07: Relationship between revenues and costs with products sold (excluding labor costs)

Identification	Operating Revenues (USD \$)	Cost of Goods Sold (USD \$)	%
Property 01	647.90	346.60	55.28
Property 02	542.50	535.85	98.77
Property 03	623.10	213.18	34.21
Property 04	697.50	228.22	32.72
Property 05	465.00	248.00	53.33
Property 06	1,100.50	353.37	32.11
Property 07	715.33	444.52	62.14
Property 08	732.38	435.53	59.47
Property 09	705.25	364.30	51.66
Property 10	868.00	499.91	57.59

Source: Data from the survey (2015).

It can be verified that the exclude the labor costs of the products , the activity is profitable in all properties studied. However the property 02 was not efficient in their costs, which accounted for approximately 98% of revenues in that period, even excluding labor costs.

RETURN ON INVESTMENT

After highlighting the revenue and costs associated with the production of milk, it was found the return realized by rural producers on the investment in their properties. In order to obtain the results, we used the average net profit per year, divided by total assets (investment).

However, for calculating the values we considered the costs with and without labor, thus allowing a comparison between the values. It is worth noting that the results of the calculations for the returns on the assets, included labor costs, if they differ in a negative way in the determination of the balances. However, Table 08 shows the return of each property:

Table 08: Return obtained in the production of milk.

identification	Return on Investment (ROI) annual		Profit Margin USD\$ annual	
	With labor (%)	Without labor (%)	With labor (%)	Without labor (%)
Property 01	0.97	4.44	-0.10	0.44
Property 02	1.44	-0.04	-0.44	0.01
Property 03	2.73	23.02	0.08	0.64
Property 04	16.18	21.76	0.48	0.65
Property 05	-1.61	12.70	-0.06	0.44
Property 06	9.14	17.68	0.34	0.66
Property 07	-3.41	9.18	-0.13	0.36
Property 08	-1.33	5.40	-0.09	0.38
Property 09	-1.05	14.17	-0.03	0.46
Property 10	-0.01	7.96	0.00	0.40

Source: Data from the survey (2015).

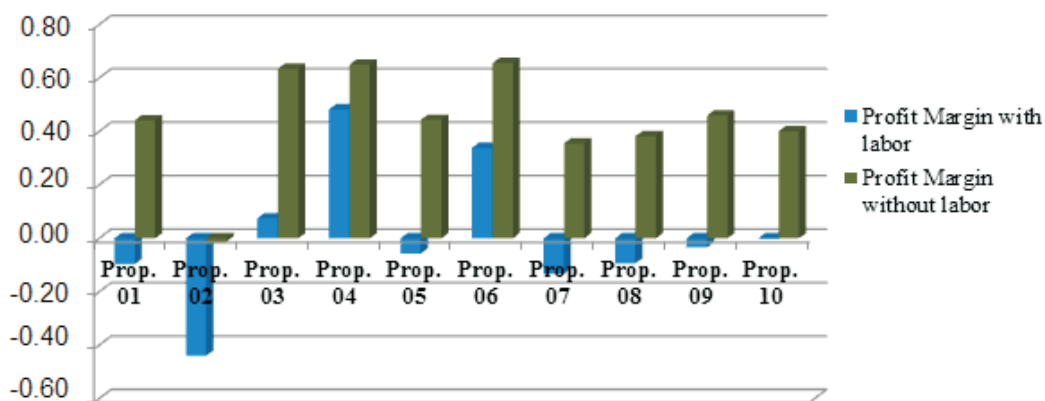
For purposes of calculation of the return on the investment, was performed an average of annual profit. For calculating the result was considered to be the average net profit per year for each property, dividing this way by asset (investment) individual. In relation to total assets, was considered the value of the investment in cows, oxen, machine milking, refrigerator, paddock, and all investment made with artificial insemination, i.e. with semen and nitrogen.

In relation to the return on the investment considering the values with labor, the property 04 (four) stood out as obtain the greatest return on your assets, i.e., obtained an annual return of 16.18% on the amount invested. Whereas the return on the investment excluding the values with labor, the property 03 (three) had the highest annual return, i.e. it gets each year 23.02 % of the amount invested in the production of milk.

Already analyzing the data including the value to labor, it was found that 60% of the properties do not have a positive return on their investment, i.e. with determination of the values of the return, half of the properties have a negative return.

In relation to the profit margin obtained by each property, for a better view, was drawn up a graphic chart showing the oscillations with and without the values of labor, as shown in figure 02.

Figure 02: profit margin with and without labor.



Source: Data from the survey (2015).

For calculating the values of the profit margin was considered the net profit by dividing by the amount of sales of that period. In figure 02, it is evident the negative profitability including labor costs 70% of the properties. On the other hand, there is a profit margin positive among all the studied properties, i.e. all properties yielded a profit in their production of milk, except the property 02, which was a loss of USD\$ 0.003 cent per liter sold, thus generating a monthly loss of USD\$ 5.8. Already the property 06 (six) stands out in a positive way, because it was a margin of profitability of USD\$ 0.164 per litre of product sold, demonstrating their efficiency in relation to profitability. In this sense, some properties came to obtain a profit above 60% on their sales in that period, thus demonstrating a great ability to gain on their sales.

PAYBACK

With calculation of the data, it was possible to verify the amount of time that the properties will lead to recover the value of investment in milk activity. This way, was drawn up a table for better visualization of the oscillations, as shown in Table 09.

Table 09: Representativeness of the time for recovery of the amount invested.

Identification	Annual Payback with labor (years)	Annual Payback without labor (Years)
Property 01	103.55	22.54
Property 02	-69.23	-2,833.88
Property 03	36.69	4.34
Property 04	6.18	4.60
Property 05	-62.03	7.88
Property 06	10.94	5.66
Property 07	-29,35	10.89
Property 08	-75.45	18.53
Property 09	-95.39	7.06
Property 10	-7,001.35	12.57

Source: Data from the survey (2015).

For calculating the results of Payback, we used the value of the total investment made in each property by the average value of annual profit. In this way, with the demonstration of Table 09, it is to be noted that in relation to the rates for the Payback excluding labor, it was observed that the property 03 had the lowest time to recover the value of the investment, i.e., it will take about 4.34 years for the return of invested capital, which implies a rapid return in relation to the amount applied. On the other

hand, whereas the labor, it was found that among the positive results, the property 01 stands for get a return in a longer period of time, i.e. , the same will take approximately 103 years to recover the investment made in relation to negative indices, these stand out unfavourable, because not recover the value invested with the time. In this sense Crepaldi (2010) ensures that a company/property will only continue if you get profit and render their investors the value that they invested, thus the profit occurs by means of strategies laid down, where the factors necessary for the generation of profit are directly related to the prices and volume of products sold, i.e. if the property remain with the same standards of production and not seek sources of increase revenue through maximising the volume of milk per day, so that it is efficient in their costs, thus making a profit in its production, the investment will be considered unfeasible by the long period of time taken for recovery of the amount invested for the benefit of the dairy activity.

CONCLUSIONS

The research demonstrated in its analysis, the results relating to costs with and without labor, whereas which the rural producers use family labor to meet their daily activities, as a way to obtain a higher viability in milk production, demonstrating the impact causing when included this cost to the activity. In this way, the disbursement by other parties, for the realization of dairy activities, becomes unfeasible, as demonstrated results.



The properties expressed their seals in the period of study approximately 3,983.5 litres of milk, which were sold at an average of USD\$ 0.18 liter, in this sense, generated an average income of USD\$ 707,66. However, considering the costs, these totalled USD\$ 6,692.00 with labor and USD\$ 3,666.75 without labor, in this context, the cost of goods sold accounted for 94.57% and 51.85%, respectively, of revenues obtained during that period.

On the basis of results in the Association of Rural Producers in the Rio Claro (APRURIC), it was noted that some producers are limited to invest in dairy farming, being this fact confirmed in good part of properties studied because, according to the survey, 60% of the rural producers have a cooler. In this way, whereas investments in mechanized milking, it was found that only 30% of the properties have the equipment.

In this sense, the investment in genetic improvement of the flock through artificial insemination, milk quality through mechanized milking, cooling of the product immediately after milking and a system of paddock, contribute in a direct way to a satisfactory result, generating a

profitability and a positive return, it is worth noting that the only property that presented a prejudice in their activity has no refrigerator and/or mechanical milking.

On the basis of the study carried out in 10 properties, it was found that the return on investment in the production of milk, it is a good thing if it is disregarding the value to labor, but to take into account the cost of the labor that return is positive and only 30% of them. Already analyzing the term that the producers take to recover their investments, disregarding the values with labor, 90% of the properties studied had a positive result, and for the periods of return on the capital invested, these were relatively satisfactory.

In relation to the prospects of future investments, only 02 (two) producers wishing to carry out investments aggregates the production of milk, to which aims at the acquisition of a machine mechanical milking and the other aims get your own feed factory to complement the power of the flock, with this, the estimated value for the investment required of the plant in question, totals the amount of USD\$ 2,500. In this way, according to the data obtained, it should be noted that among the properties studied, the majority of producers don't seek ways to increase milk production, limited to traditional patterns.

As a suggestion for future studies, indicates to analyse the activity as a complement to monthly income, it is considered that rural producers selling the calves, which can raise the result obtained by the activity. Also must be taken into account the fact that the properties that are enacting with family labor, are developed several other activities, in addition to the production of milk. Being the production of milk in most cases an additional income and/or the possibility of a cash flow monthly.

Conflict of Interest

The authors verify that there are no competing interests.

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