DAIRY CHAIN IN FOUR SEATS OF THE AGRARIAN REFORM IN THE UNAI-MG MUNICIPALITY

Rodrigo Lopes Bassoli [1]
Érica Campos Ribeiro[2]
Diego Azevedo Mota[3]
Thiago Vasconcelos Melo[4]
Anderson Alvarenga Pereira[5]

ABSTRACT

This study aimed at examining the way the operational costs were distributed, as well as the financial profitability of the milk chain in 04 rural agrarian reform settlements in Unaí city. The economic profitability of the milk ventures in the settlements was confirmed to be heterogeneous. In each settlement, it became evident that the total expenditure, Labor Unit Man, property areas and commercialization of cattle were the factors that had no direct impact on the economic gain from the milk chain.

Key words: family agriculture, operational costs, rapid and dialogic diagnosis (RDD)

RESUMO

O estudo teve como objetivo investigar a distribuição dos custos operacionais e rentabilidade econômica da cadeia leiteira em 04 assentamentos da reforma agrária no município de Unaí. Constatou-se que a rentabilidade econômica da atividade leiteira nos assentamentos é heterogenia. Despesa total, Unidade Trabalho Homem, área da propriedade e comercialização de bovinos são fatores que não impactaram diretamente a rentabilidade econômica da cadeia leiteira em cada assentamento.

Keys Words: agricultura familiar, custos operacionais, diagnóstico rápido e dialogado (DRD).

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[1] Engenheiro Agronomo. UFVJM. E-mail: rodrigobassoli@hotmail.com.br

[2] Engenheira Agronoma – Biooflora.

[3] Docente do Instituto de Ciencias Agrárias – UFVJM.

[4] Instituto de Ciências Agrárias da Universidade Federal dos Vales do Jequitinhonha e Mucuri – UFVJM.

[5] Docente do Instituto de Ciencias Agrárias – UFVJM.

1. INTRODUCTION

To guarantee the development of the position of family agriculture within the socioeconomic framework, a public policy termed agrarian reform has been established. It involved diversification of the employment availabilities and the modernization of both economic and social connections in the rural areas and interior regions.

During the latter half of the 1980s, a plethora of land acquisition efforts were taken in Northwest Minas Gerais. This area was characterized by a commendable social and political environment, when the re-democratization of the country began. At present, the rural settlements situated in the Northwest Minas Gerais regions are foundational to the dynamic economic development of the municipalities in which they occur.

The Brazilian Institute of Geography and Statistics (IBGE) data records 3,593 rural establishments in the municipality, 2,734 (76.1%) of which are from family agriculture. The city of Unaí ranks eighth in terms of the national dairy basin (IBGE 2012), producing 320,000 liters of milk as the daily output. Thus, it becomes clear that the settlers exceeded the production that had been intended solely for self-consumption and grew to emerge as producers of marketable surplus.

The Unaí municipality occupies a site in an area that supports 206 Settlement Projects (SP), and nearly 12,000 families, which constitutes the Regional Office of the Federal District and Surroundings - SR 28. Unaí includes 26 SPs, extending across 80,000 hectares. Between 2000 and 2015 the number of settlements in this area doubled (National Instance of Colonization and Agrarian -INCRA). Despite the creation of several settlements, their low quality was clearly evident. This highlighted the collapse of the agrarian reform process in this area. (Santos e Silva, 2007).

In Unaí, family farming is a central part of its agricultural framework. Among the 3,593 rural establishments existing in the municipality, 2,734 (76.1%) arise from family agriculture. Prominent against this backdrop are the settlers of agrarian reform, whose ventures in dairy farming include structuring the establishments (IBGE 2012).

Minas Gerais is remarkable from a national perspective, in terms of milk production. This state accounts for Brazil's greatest dairy output, generating nearly 8.9 billion liters of milk annually, corresponding to 28% of the total national production (IBGE 2012). Another noteworthy statistic is its ranking as the eighth national dairy basin (IBGE 2012). Its daily output of 115,000 liters of milk, which is centralized by Unal Ltd.'s Agricultural Co-operative (CAPUL), resells almost the entire production to the ITAMBÉ dairy cooperative

This study aimed at comparing the distribution of costs and revenues gained from the *in natura* commercialization of milk in 04 settlements within the Unai municipality.

2. MATERIALS AND METHODS

The work was carried out in four settlements of Unai municipality (São Pedro Cipó, Santa Marta, São Miguel and Jiboia). Was used the Rapid and Dialogic Diagnosis (RDD) according Gastal et al., (2003). The settlers were called first for a meeting regarding their specific lots. Next, the specific questionnaires for the RDD were given. All such meetings were promoted by the technical assistance and rural extension - TARE staff of the Caritas Diocesana of Paracatu. Prior to the meetings, training was given to the team to standardize the data collection method.

Applying the RDD methodology, structuring of the knowledge, analysis and dynamic interpretation of the conditions of the rural areas through their various constituents was done viz., the production systems, natural resources and social organization. Therefore, it was essential to solve problems and find alternatives as part of the solution. Between August and October 2015, data was collected through the application of 214 questionnaires by the technical staff of the Caritas Diocesana of Paracatu.

According to the findings of Sabourin et al., (2007) the questionnaire applied included the following items that were dealt with, based on the Rapid and Dialogical Diagnosis method. Labor: Family composition and characterization of the labor techniques utilized; Crops: List of crops, their

respective areas, production and the destination of this production (family consumption, marketing, animal consumption, among others); Flocks: Cattle, swine and birds. The types of breeding systems and goals of breeding (family consumption, commercialization, animal consumption, among others); Sources of monetary inflow: Production tickets and points of sale; External source of income: Social security benefits (retirement by age and disability, sickness aid, maternity aid, death pension), family grant, sale of labor, rent of pasture, provision of services, among others; Expenses: The main products purchased for establishment operations and family maintenance. Purchase locations of these products;

The diagnosis was supplemented with the information mentioned below:

Production Systems: Product destination, marketed products, types of commercialization, product markets; Labor market: Occupation / employment and unemployment / unemployment prevalent in the settlements;

Through the database created in Microsoft Excel, identification and filtering could be done, of the beneficiaries marketing their milk output. The goal involved the selection of variables which exerted a direct impact upon the dairy chain and the gross and net revenues from this occupation.

The variables were listed under the following subjects: Plant production: Agricultural mechanization, inputs, seeds and soil correction; Supplements: Ration, white and mineral salt; Fuels: Gasoline and diesel oil; Energy:Electric energy; Health: Medications and vaccines; Labor: Hiring of permanent and temporary employees; Total expenditure: Sum of the expenditure-linked variables; Bovine production: Cattle sale; Others: Occasional expenses connected directly or indirectly with milk generation, of which the following involve expenses associated with the Union / Association, water, accounting, maintenance expenses or small investments in the lot; Gross Revenue: Sum of the revenue gained from milk and cattle sales; Net revenues: The difference between the variables of Gross revenue and Total expenses.

An analysis was made for each settler, so that every piece of information gathered through data collection was considered. The analysis of variance was done for the data on all the variables following a completely randomized design, involving four treatments (settlements) and different numbers of replicates (owners / lots). Thus, a model considering the fixed treatment effect alone was included in the analysis. The Satterthwaite's degree of freedom was applied for the unbalanced data. Analysis of variance was done for the data applying the MIXED procedure of Statistical Analysis Systems (SAS Inst. Inc., Cary, NC, USA, version 9.2). When a significant effect was to be considered, a probability level of 5% or below was adopted for the F-test. When the analysis of variance revealed significant differences, the Tukey test was used to discriminate the means of the minimum squares.

To validate the SAS data, the identical analysis was performed using the SPSS Statistical Package for Social Sciences. This tool is used to give the answers which the databases alone cannot provide, and which are essential for decision making. It facilitates information generation, which can be represented in both Tables and graphs, as well as in more elaborate statistics, as shown (Weaver & Black, 2015).

3. RESULTS AND DISCUSSION

Table 1 reveals that for the production-costs related variables viz., Vegetable Production, Supplements, Fuels, Energy, Health, Labor, Household Expenditures and Others, only the variable listed as Others showed significant effect according to the analysis of variance. However, it is noteworthy that this variable does not directly affect production costs, as it can be equivalent to eventual costs, regardless of whether it is linked to the dairy chain or not. Therefore, it does not exert any direct impact on the revenue obtained.

However, according to the analysis of variance, the variables Net Revenue and Gross Revenue registered different means; when the mean test was applied it was more effective in both the settlements in São Pedro Cipó. This information confirms that the settlements differ among themselves in terms

of the efficiency in utilizing the money gained and in obtaining profits from the milk sale. In family agriculture, the internal workforce or family is recognized as an extremely significant factor in the development of the lot. However, in the present study, although the variable Unit of Work Man (UHW) familiar remained unchanged among the settlements, identical profits were not evident. Despite this, the São Pedro Cipó settlement property extended across a larger area than the others. Nevertheless, even this knowledge was not sufficient to attribute to this variable the efficiency of the settlement as obtaining the highest net and gross revenues, because despite the larger total area, it was not possible to assume that the entire area was productive.

The dairy chain involves cattle sale which supplements milk marketing. This variable facilitated highlighting the difference in the mean values as the variable Net Revenue. Cattle production, however, remained unchanged in all the four settlements. Besides, the settlements in this study did not reveal specific breeds exclusively for milk production. In fact, the flock basically included cross-bred animals, which enabled the sale of male animals born in this system, clearly revealing that cattle ranching included a mixed livestock. This has been proven to be the most viable practice, as it diversifies the income sources, and such diversification raises the income from the property.

The factor herd size directly impacts the milk production. Although it has a smaller pasture area, and supports a animal stocking rate which is not ideal, the SP Jibóia reveals better results (Net Revenue) and lower expenses with supplementation than does the São Pedro Cipó settlement, with its more acceptable stocking rate and larger pasture area than the others. This data reiterates that the management techniques employed and pasture quality in São Pedro Cipó are some of the bottlenecks in this and other settlements, as evident from the high values of animal supplementation and low expenses on plant production. Poor pasture quality is also limited by seasonality. According to Campos & Ferreira Neto, (2008) differences in the technical efficiency of the producers are evident within the same settlement. From their study only 16% of the settled producers were found to be efficient. Cost reduction of 48.15% and 23.02% on average, for energy /

fuel and concentrate costs, respectively, was one of the hypotheses proposed by Altafin (2011), besides an increase in the average productivity per animal of least 5.29 liters / day for the inefficient settlers.

Table 1. Comparison of variables related to properties, productivities, expenses and revenues in 04 different settlements of Unaí. Data obtained in the year 2015.

Variable	Settlements				Value of P
	Jibóia (n=9)	Santa Marta (n=17)	São Miguel (n=19)	São Pedro Cipó (n=29)	
Owner's Age	49,4 (3,99)[ab]	45,8 (2,90)[ab]	45,0 (2,74)[b]	55,0 (2,22)[a]	0,02
Family UHW	2,6 (0,28)	2,3 (0,20)	2,8 (0,19)	2,2 (0,15)	0,07
Larger Total Area (hectare)	20,6 (3,05)[b]	15,0 (2,22)[b]	20,8 (2,10)[b]	47,9 (1,70)[a]	<0,01
Animal Unit (AU)[*]	16,1 (4,85)[ab]	11,8 (3,53)[b]	15,1 (3,34)[b]	30,4 (2,70)[a]	0,02
Animal Stocking Rate	1,52 [ab]	1,52 [ab]	2,07 [a]	0,92 [b]	0,05
Pasture Area	12,98 [b]	9,70 [b]	10,23 [b]	35,22 [a]	<0,01
Bovine Production (R$)	14.444 (4.602,9)	824 (3.349,1)	442 (3.167,9)	8.531 (2.564,2)	0,03
Plant Production (R$)	-3.961 (1.607,5)	-3.057 (1.169,6)	-5.296 (1.106,4)	-2.726 (895,5)	0,32
Suplements (R$)	-12.167 (5.581,9)	-5.663 (4.061,4)	-10.315 (3.841,7)	-17.663 (3.109,6)	0,13
Fuels (R$)	-1.030 (1.273,1)	-1.094 (926,3)	-2.856 (876,2)	-1.094 (709,2)	0,39
Energy (R$)	-660 (384,2)	-1.155 (279,6)	-1.026 (264,4)	-1.525 (214,1)	0,20
Health (R$)	-388 (267,4)	-567 (194,5)	-213 (184,0)	-313 (148,9)	0,60

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Labor (R$)	-556 (688,9)	-421 (501,3)	-1.359 (474,2)	-1.012 (383,8)	0,54
Family Expenses (R$)	-7.320 (1.167,5)	-6.614 (849,4)	-6.783 (803,5)	-7.712 (650,4)	0,71
Others (R$)	159 (535,3)[b]	915 (389,5)[ab]	1.947 (368,4)[a]	630 (298,2)[b]	0,02
Total Expenses (R$)	-25.685 (7.928,1)	-19.486 (5.768,5)	-29.796 (5.456,5)	-32.675 (4.416,6)	0,33
Gross Revenue (R$)	46.197 (13.483,0)[b]	16.405 (9.810,1)[b]	23.663 (9.279,4)[ab]	50.152 (7.511,0)[a]	0,03
Net Revenues (R$)	20.512 (8.541,3)[ab]	−3.081 (6.214,7)[ab]	−6.132 (5.878,6)[b]	17.477 (4.758,3)[a]	<0,01

Average minimum squares (standard error); n = number of owners / lots evaluated in the settlement. [a, b] Mean of minimum squares followed by different letters between the settlements differ statistically at a level of significance of 5% by the Tukey test.* 450 kilos of live weighth

The São Pedro Cipó settlement was among the settlements having the greatest number of answered questionnaires. Besides, it also included a higher number of milk-commercializing families (47.5%); this statistic varied from the São Miguel settlement where this percentage was lower (25.3%), highlighting that TARE will need to exert greater efforts, both in terms of the professionalization of milk production and diversification of production in the settlements that sell less of this product.

Table 2. Number of families questioned in 04 settlements located in the city of Unaí-MG

Settlements	Number of families	Number of families selling milk
Jiboia	34	9
Santa Marta	43	17
São Miguel	75	19
São Pedro Cipó	61	29
Total	213	74

In comparison to the variables linked to costs, supplementation appeared to be more representative. In SP Jiboia alone, this was not the most expressive variable. When the settlements in this study were compared, the cost of animal supplementation varied among the settlements from 29 to 54%. Table 1 shows that in all the settlements, the average of the volume spent on food is greater in relation to the expenditure involved with the vegetal production because vegetable production in the dairy chain is directly connected to the production of bulks during the dry season, as well as for the acquisition of concentrate. This seasonality-dependent framework is not limited to these settlements, but is rather common throughout Brazil. Therefore, the question that begins to arise is whether the type of work done by the TARE is producing the anticipated results.

This variation is lacking when the variables of expenses for fuels, energy, household needs and labor were analyzed (Table 1). These variables are linked

with lot and family expenses. When the standard deviation was applied, the variables of family expenditure and milk revenue showed discrepancy, and SP São Pedro Cipó revealed greater divergence than the other settlements. The difference seen implies that the efficiency of one settlement can be greater than another in terms of milk production and cost distribution.

The disparity among the settlements becomes evident when the net income of the activity is discussed. In fact, in 03 settlements it became obvious that 25% of their beneficiaries operated on negative net balance. Only the SP São Pedro Cipó among the settlements was seen to maintain a positive balance. One of the reasons for this was the experience of its settlers in their occupation. Also, their location in the vain supported the specific logistics that the milk chain required, which differed from that of the other settlements situated on the plateau. A similar disparity was also obvious in the Curral do Fogo settlement, in which 43% of the profitability of the lot was restricted to only 8 of the 63 beneficiaries (Xavier et al., 2005). Another factor of concern is that in Santa Marta and São Miguel, 75% of these produce around R$ 400.00 per month net income, less the current minimum wage.

These poor results of batch profitability are often triggered by the incompetence or inexperience in milk production, where several settlers find themselves becoming part of this chain solely due to the paucity of other options, or even the restrictions in the lot. This makes the production of a different activity difficult, as the details for this must be cautiously developed by the TARE, in order to circumvent the socioeconomic helplessness of the settled family.

4. CONCLUSIONS

While this study was able to confirm that the 04 settlements incurred identical expenditures, they differed in the net and gross revenues obtained from the sale of the milk. Therefore, heterogeneity in gaining profits and the pattern of distribution of expenses were clearly evident from the dairy chain in the settlements of the Municipality of Unaí-MG. Some of these factors like UHW, commercialization of cattle, extent of the property and total expenditure were found to exert no influence on the differences evident in profit-making. This demonstrates that the practice in the settlements involves production which

includes raising cattle not specialized in milk production, but rather a combination of milk and meat.

REFERENCES

ALFTAIN, I.; PINHEIRO, M.E.F.; VALONE, G.V.; GREGOLIN, A.C. Produção familiar de leite no brasil: um estudo sobre os assentamentos. Revista UNI, v.1, n.1, p:31-49, 2011.

CAMPOS, S.A.C.; FERREIRA NETO, J.A. Eficiência técnica dos produtores de leite em assentados rurais da reforma agrária. Revista de Economia e Agronegócio, v.6, n.3, p:395-414, 2008.

GASTAL, M. L.; XAVIER, J. H. V.; ZOBY, J. L. F.; ROCHA, F. E. C.; SILVA, M. A.; RIBEIRO, C. F. D. de A.; COUTO, P. H. M. Projeto Unaí: diagnóstico rápido e dialogado de três assentamentos de reforma agrária. Planaltina, DF: EMBRAPA Cerrados, 2003. 74p.

IBGE - Instituto Brasileiro de Geografia e Estatística. Cidades. Available in: http://www.cidades.ibge.gov.br/xtras/temas.php?lang=&codmun=317040&idtema=121&search=minasgerais|unai|pecuaria-2012>.Acess in: September, 30, 2016.

INCRA – Instituto Nacional de Colonização e Reforma Agrária. Painel de Assentamentos. Superintendência Regional Distrito Federal e Entorno - SR 28. Available in:< http://painel.incra.gov.br>.Acess in: July, 30, 2017.

MARTINS, J.S. Reforma agrária – o impossível diálogo sobre a História possível. Tempo Social. V.11, n.2, p:97-128, 1999.

SABOURIN, E.; OLIVEIRA, M.N.; XAVIER, J.H.V. Lógica familiar e lógica coletiva nos assentamentos de reforma agrária: o caso do município de Unaí- MG - Brasil. Estudos Sociedade e Agricultura, v.15, n.1, p: 23-61, 2007.

WEAVER, B. and A. BLACK, R. Comment on Hoffman and Rovine (2007): SPSS MIXED can estimate models with heterogeneous variances. Behaviour Research, v.47, n.1, p:355–360. 2015.

SANTOS, J.R.S.; SILVA, E.F. A educação de jovens e adultos em movimento: a alfabetização como possibilidade de uma ação emancipatória no MST. Revista Educação Popular, v.10, n.1, p:66-78, 2011.

XAVIER, J.H.V.; CALDEIRA-PIRES, A.; ZOBY, J.L.F.; GASTAL M.L. Análise de ciclo de vida (ACV) de sistemas de produção da agricultura familiar em unaí, MG: resultados econômicos e impactos ambientais. Cadernos de Ciência & Tecnologia, v.22, n.3, p:547-586. 2005.