

Evaluation of changes in routines of milk producers in coping with the COVID-19 pandemic in the Taquari Valley and Serra Gaúcha region, Rio Grande do Sul State, Brazil

Avaliação de alterações nas rotinas dos produtores de leite no enfrentamento da pandemia de COVID-19 no Vale do Taquari e na região da Serra Gaúcha, Estado do Rio Grande do Sul, Brasil
Evaluación de los cambios en las rutinas de los productores de leche ante la pandemia de COVID-19 en el Valle de Taquari y la región de Serra Gaúcha, Estado de Rio Grande do Sul, Brasil

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Abstract

In Rio Grande do Sul State (RS), Brazil, the negative impacts of the pandemic were noticed in March of 2020, with various sectors suffering the impacts, such as industry, wholesale, and retail. Milk production has always been historically present and part of human development, especially in the Taquari Valley region, as it represents the basis of the economy of most small rural properties in the surrounding counties. Considering the difficulty observed by small-scale milk producers to adapt to the new daily procedures on the properties in the face of the COVID-19 pandemic, the present study aimed to assess changes in the routines of rural producers in view of the health situation, preventive care, and important factors in tackling the pandemic in Taquari Valley and Serra Gaúcha (RS). An exploratory study applied on 51 farms revealed that the vast majority have adopted safe practices, such as hand washing and using hand sanitizers and masks. The price of milk, the need to change milk management, and technical assistance during the COVID-19 pandemic are the most concerning factors for 96% of the respondents. Although the pandemic has pointed out several economic problems, the majority (88%) of the producers do not intend to abandon the dairy activity in this scenario that the world faces.

Keywords: Food security; COVID-19; Milk production; Pandemic.

Resumo

No Estado do Rio Grande do Sul (RS), Brasil, os impactos negativos da pandemia foram percebidos em março de 2020, com diversos setores sofrendo os efeitos, como indústria, atacado e varejo. A produção de leite sempre esteve historicamente presente e fez parte do desenvolvimento humano, principalmente na região do Vale do Taquari, pois representa a base da economia da maioria das pequenas propriedades rurais dos municípios do entorno. Diante da dificuldade observada pelos pequenos produtores de leite em se adaptarem aos novos procedimentos do cotidiano das propriedades frente à pandemia do COVID-19, o presente estudo teve como objetivo avaliar as mudanças nas rotinas dos produtores rurais diante da situação de saúde, cuidados preventivos e fatores importantes no enfrentamento da pandemia no Vale do Taquari e na Serra Gaúcha (RS). Um estudo exploratório aplicado em 51 fazendas revelou que a grande maioria adotou práticas seguras, como lavar as mãos e usar desinfetantes e máscaras. O preço do leite, a

necessidade de mudar a gestão do leite e a assistência técnica durante a pandemia COVID-19 são os fatores mais preocupantes para 96% dos entrevistados. Embora a pandemia tenha apontado diversos problemas econômicos, a maioria (88%) dos produtores não pretende abandonar a atividade leiteira neste cenário que o mundo enfrenta.

Palavras-chave: Segurança dos alimentos; COVID-19; Produção de leite; Pandemia.

Resumen

En el estado de Rio Grande do Sul (RS), Brasil, los impactos negativos de la pandemia se percibieron en marzo de 2020, con varios sectores sufriendo los impactos, como la industria, el comercio mayorista y minorista. La producción de leche siempre ha estado presente históricamente y forma parte del desarrollo humano, especialmente en la región del Valle de Taquari, ya que representa la base de la economía de la mayoría de las pequeñas explotaciones de los municipios de los alrededores. Dada la dificultad observada por los pequeños productores de leche en la adaptación a los nuevos procedimientos de la vida cotidiana de las propiedades frente a la pandemia de COVID-19, este estudio tuvo como objetivo evaluar los cambios en las rutinas de los agricultores frente a la situación de la salud, la atención preventiva y los factores importantes para hacer frente a la pandemia en Vale do Taquari y Serra Gaúcha (RS). Un estudio exploratorio aplicado a 51 granjas reveló que la gran mayoría adoptó prácticas seguras, como el lavado de manos y el uso de desinfectantes y mascarillas. El precio de la leche, la necesidad de cambiar la gestión de la leche y la asistencia técnica durante la pandemia de COVID-19 fueron los factores más preocupantes para el 96% de los entrevistados. Aunque la pandemia ha señalado varios problemas económicos, la mayoría (88%) de los ganaderos no tiene intención de abandonar la ganadería lechera en este escenario al que se enfrenta el mundo.

Palabras clave: Seguridad alimentaria; COVID-19; Producción de leche; Pandemia.

1. Introduction

The coronavirus has caused great global impacts, especially in Brazil in recent months. COVID-19 is an infectious disease caused by Severe Acute Respiratory Syndrome 2 (SARS-CoV-2), which are enveloped RNA viruses of medical and veterinary importance. Interest in this viral family has intensified in recent years due to the identification of a newly emerged coronavirus as the causative agent of severe acute respiratory syndrome (SARS) (Franco; Landgraf; Pinto, 2020). These organisms are widely distributed among mammals, birds, and cause respiratory and enteric diseases, although in some cases, neurological diseases or hepatitis. Coronaviruses usually infect their hosts in a species-specific manner and infections can be acute or persistent (Masters, 2006).

As for the human coronavirus, according to the Pan American Health Organization (PAHO), the highlights are HCoV-229E, HCoVOC43, HCoV-NL63, and HCoV-HKU1 that cause the common cold, the Middle Eastern Respiratory Syndrome (MERS-COV), which was discovered in 2012 and SARS-CoV-1 and SARS-CoV-2, respectively, discovered in 2002 and 2019, which cause life-threatening pneumonia. Ahmed, Quadeer and McKay (2020) described that just like SARS-CoV-1 and MERS-CoV, the recent SARS-CoV-2 belongs to the genus *Betacoronavirus* and its structural proteins include the spike protein (S), the envelope protein (E), the membrane protein (M), and the nucleocapsid protein (N).

Public health officials around the world have been asking people daily to apply social distancing with each other in the hope of decreasing the number of cases. As necessary as these steps are from the medical point of view, there is another perspective: large sectors of the economy are ceasing their activities. In fact, the more the SARS-CoV-2 virus spreads around the world, as there are more, than 99 million confirmed cases of related COVID-19 disease, to date, the greater the concern for our health and livelihood. Hence, the question that remains is "what are the impacts of the COVID-19 pandemic on the global and regional economies?"

Despite the reduced spread of the pandemic and number of cases, COVID-19 is resurging to spread rapidly. The Food and Agriculture Organization of the United Nations (FAO) is particularly concerned with people's access to food in the medium and long term. The significant slowdown in all economies in the world has forced countries, especially the vulnerable ones due to soaring unemployment rates and their dependence on food imports, to feel the economic impacts of the virus and thus fight for the necessary resources (Fao, 2019).

The federal, state, and municipal governments had urgent demands to be solved with the context of the Pandemic in Brazil, starting to define emergency actions to face the problems and contemplating family farming. (Breitenbach, 2021).

The food system that we have built and as we know it today is flawed and vulnerable. It is not efficient and sustainable on the supply side, as many workers in the processing sector have been infected in their work environment and many small family farmers have not been able to sell their products and maintain the livelihoods of their families. On the demand side, the system is also flawed, especially in the fact that the food is almost exclusively delivered to those who can afford it. Supermarkets and grocery stores need to have products to offer, but above all one must not forget that those citizens who do not have a pantry at home should not be denied access to food (Schneider et al, 2020).

1.1 Impacts of the pandemic on milk production in RS

Regarding the types of activities, RS was impacted by COVID-19 in the period from March 21 to 27, as there was a 35% drop in industry, 17% in wholesale, and 43% in retail. On the other hand, consumption increased in the industrial sector, especially in the food sector in the first week. Capital goods production was not significantly affected, which may be due to it presenting longer purchasing periods or part of the orders having been made before pandemic measures occurred (Seapdr, 2020).

According to FAO, India is the largest milk producer in the world (22% of the world production). Brazil is the fifth largest producer with about 34 billion liters produced in 2018. In RS, production is well distributed across the state, with the Fronteira Noroeste, Taquari Valley, Serra, Produção, Celeiro, Norte, and Rio da Várzea regions being responsible for half of the production (Seapdr, 2020).

Moreover, milk production in RS is somehow present in 152,489 rural properties, which are spread across 494 of the 497 state counties, representing an average of 308.68 rural properties per county that produce milk, with the most varied destinations for the product. In the vast majority of the counties (452 counties; 90.95%), the producers sell to industries, cooperatives or cheese makers (50,477 producers in total), while milk processing by producers in their own legalized agribusinesses occurs in only 112 counties. Of the 187 producers who process milk in their own legalized agribusiness, it is estimated that 1/3 of the milk producers are associated with some dairy industry. The total milk production in the state is estimated to reach 4.27 billion liters per year, resulting in an average of about 8.65 million liters per year for each one of the 494 counties where there is some milk production in RS. Additionally, a little more than 3.9 billion liters (92% of the total produced in the state) is destined to the dairy industry, representing approximately 8.7 million liters per year for each of the 452 counties where they are linked to the milk industry (Emater, 2019).

Milk production is part of the history and development of the Taquari Valley region. In 2006, the 36 counties of this region had 23,345 agricultural establishments and 95,859 milking cows that resulted in a production of 286,620,000 liters of milk in the year 2008 (Rempel et al., 2012). Such production represents the basis of the economy of most small rural properties in Taquari Valley, thus highlighting the importance of this production system.

Despite being present in all Taquari Valley counties, milk production is concentrated, according to data from 2014, in 11 of the 36 counties which contributed with approximately 60% of the region's production (Feix; Fauth, 2015). In the same year, there were 35 establishments in Taquari Valley whose main activity was part of the dairy industry, hence, this region is considered the third main milk-producing region in the state with about 7.9% of the total in 2014 (Emater, 2015).

Milk production and the consequent installation of dairy companies in the region, are linked to pre-existing conditions from past colonization. German and Italian immigrants significantly influenced the cultural formation and constitution of the local productive base. The existence of cooperatives and associations of producers is noticeable in several segments, notably in the dairy industry, in which some of the largest companies were formed as milk cooperatives. This evolution is because the

genetics and feeding of the animals improved, leading to the dissemination of the use of mechanical milking and cooling of the raw material in the properties (Feix; Fauth, 2015). Moreover, the authors also state that the current profile of the milk agribusinesses operating in the Taquari Valley can be separated into three groups, being the first group of large companies, which manufacture a diversified line of products. These agribusinesses buy milk from thousands of rural producers in and out of the region and even from other companies. The commercialization of their production occurs, above all, at the national level. The second group consists of smaller industrial companies that buy milk from several local producers and offer diversified or specialized product lines (mainly cheese). The third group consists of family agribusinesses, which process and industrialize the milk produced by small farmers. These small organizations specialize in the production of pasteurized milk and cheeses (Table 1).

Table 1. Data acquired from the Socioeconomic Report of the milk production chain in the Taquari and Caí Valleys in 2019.

Indicator	Quantity	%
Milk producers	11,839	-
Milk farmers selling raw milk to industries	5,607	47.36
Dairy cows	105,577	-
Dairy cows whose product is delivered to industries	91,710	86.86
Average dairy cows/producer delivering milk to industries	16.36	-
Liters of milk produced	409,053,856	-
Liters of milk produced and delivered to industries	380,326,357	92.98
Average productivity per property/month of producers who deliver milk to industries	5,653	-
Average productivity per property/day of producers who deliver milk to industries	186	-
Milk processing industries in the region/type of inspection:		
- Municipal Inspection System (MIS)	8	42.10
- Animal Products Inspection Division (APID)	4	21.05
- Federal Inspection System (FIS)	7	36.85
Total industries	19	

Source: Emater (2019).

After the first impacts of the new coronavirus in the world, many changes in daily life took place, including restricted circulation of people, closing of borders, shutdown of services and shops, suspension of classes, and confinement of the population. These actions were adopted in order to contain the pandemic, maintaining only the services deemed essential, such as health and food services (Martin & Martin, 2020).

Different sectors are engaged in developing and applying strategies to combat COVID-19, with actions being taken that are both reactive, by minimizing or solving a problem that is already occurring, and proactive, by preventing new problems from arising. These strategies permeate the economic field, by avoiding or reducing problems of low income for family farmers, but also include social and humanitarian actions that guarantee living conditions and family reproduction (Breitenbach, 2021).

Considering the difficulty observed by small-scale milk producers to adapt to the new daily procedures on the properties, it is important to monitor and study their production conditions. Therefore, the present study aimed to assess the changes in the routines of rural producers in view of the health situation, preventive care, and important factors of coping with the COVID-19 pandemic in Taquari Valley and Serra Gaúcha regions while considering future perspectives of producing chilled fresh milk.

2. Methodology

For this study, 51 milk producers were interviewed in Taquari Valley and Serra Gaúcha (RS), linked to a dairy located in the latter region. The milk producers were duly coded from 01 to 51 in order to maintain their integrity. Among the municipalities of the Vale do Taquari and Serra Gaúcha regions, the evaluated producers are located in 14 municipalities of the state of Rio Grande do Sul. The research began on May 24, 2020 and was concluded on June 1, 2020.

The research strategy used was descriptive, applied and exploratory quali-quantitative approach and used as an instrument the collection of data employing a printed questionnaire, structured with 40 objective and subjective questions based on the criteria and procedures for the production, packaging, conservation, transport, selection and reception of raw milk, established in IN^o77-MAPA (Brazil, 2018).

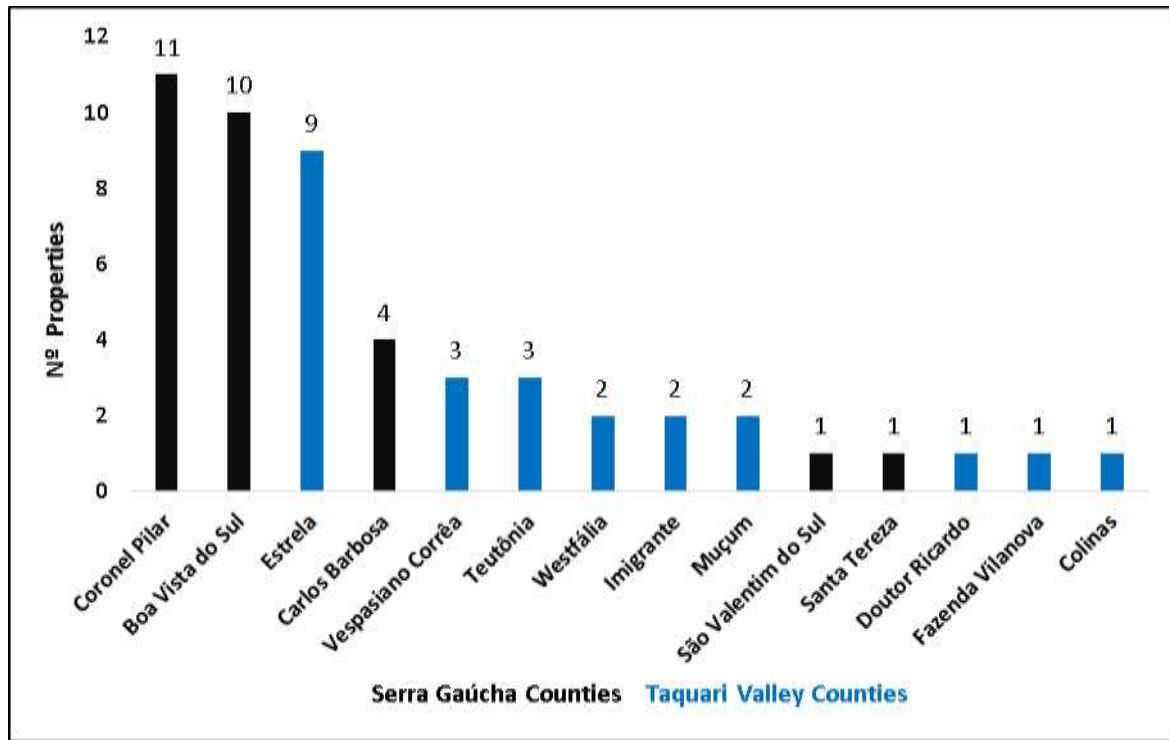
The material was printed and provided for producers to answer, through the milk transporters that collect it, this procedure was necessary due to the need for social distancing determined by the pandemic.

The data collected from the quantitative analysis of the questions were tabulated in an organized way and analyzed by frequency distribution according to the category of variables. In addition, the qualitative analysis was performed with constant comparative evaluation of the subjective questions and answers of the interviewees.

3. Results and Discussion

The application of the exploratory research with 40 questions in 51 properties resulted in 2,040 responses (Table 2). This data regarding the perception of the owners, situation of the pandemic in the state, and health of the families involved revealed that the vast majority have adopted safe practices, including hand washing and using hand sanitizers and masks. Of the total number of owners, only 1 reported that they were not carrying out any type of COVID-19 prevention. Regarding the characteristics of the properties, all producers are owners of the areas in which they live and develop the dairy activity. Most have no employees, with only 3 (5.88%) properties having 2 employees each. As for size, the majority (74.5%) has up to 20 hectares, while 22 properties have an area of up to 5 hectares. Moreover, 94% allocate up to 10 hectares to dairy farming, while 29 (56.8%) allocate up to 5 hectares for this purpose. In Graphic 1, the distribution of 51 dairy properties per county that comprise dairy activity of the Taquari Valley and Serra Gaúcha regions that have been evaluated.

Graphic 1. Distribution of 51 dairy properties per county that comprise dairy activity of the Taquari Valley and Serra Gaúcha regions.



Source: Authors (2020).

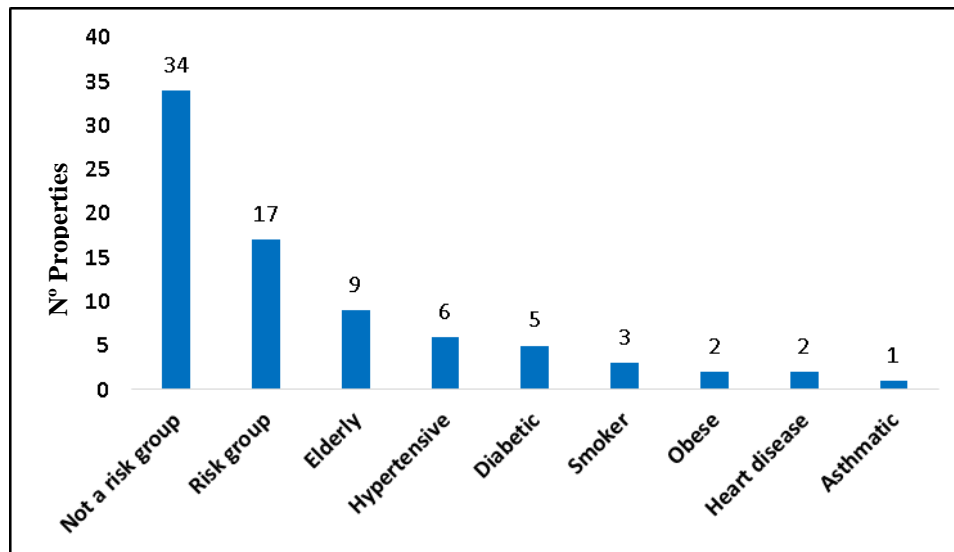
Due to the location and small nature of the producers, it is worth highlighting Technical Communication No. 103 of Embrapa (2020), which emphasizes the importance of COVID-19 prevention in rural areas. As much as rural properties provide less contact, people must also follow all care possible in the sense of individual protection, which is recommended for people in the city and countryside. In addition, it must be considered that, during this period of social distancing, many people from cities have moved to their rural properties, which may be sources of contamination by SARS-CoV-2.

Regarding the question of whether those responsible for milk collection used any personal protective equipment (PPE) to prevent the spread of COVID-19, 33 (65%) of the owners replied that they used it, 10 (20%) replied that they did not, and 8 (16%) replied they did not know. Regarding the type of PPE used, the producers also mentioned that 28 (55%) wore masks and 20 (39%) milk transporters used gloves.

Of the total of questioned owners, 33 (64%) indicated that the pandemic will last some time more, 18 (35%) answered that it will not last much longer, and 1 (1.9%) did not know how to answer. Regarding the estimated time in months, 8 (15.6%) owners think it will last 1 month, 14 (27%) for up to 3 months, 17 (33%) more than 6 months, and 11 (21%) for more than 1 year. Regarding health, only 2 (4%) reported symptoms of runny nose and tiredness, with the majority of the owners (49 owners, 96%) showing no symptoms of COVID-19.

With regard to the risk group, 34 (67%) owners answered that they do not fit into a risk group, while 17 (33%) presented some type of risk. Among these main risks, 9 (18%) are elderly, 6 (12%) are hypertensive, 5 (10%) are diabetic, 3 (6%) are smokers, 2 (4%) are obese or have heart disease, and 1 (2%) mentioned being asthmatic (Graphic 2).

Graphic 2. Owners' perception of their health situation and belonging to a risk group.



Source: Authors (2020).

Of the 51 properties, most of them (37 properties, 72.5%), with regard to family structure, have 2 to 4 resident members. In 33 properties (64.7%), only 2 members participate in the dairy activity, being that the majority of milking activities are performed basically by women in 28 establishments (55%).

Regarding information/knowledge on the COVID-19 pandemic, most owners (73%) acquired information from television and radio, 19% through the internet, 5% through dairy, and 3% from neighbors. As for those who had an internet connection, 41% of the owners reported that they learned about it on Facebook, 26% on the search engine Google, 18% the application WhatsApp, 11% through online newspapers, and 4% from other sources.

Regarding the way in which the pandemic affected the routine in rural properties, 59% of the interviewees mentioned that the routine was not affected, 84% had no problems in accessing raw materials and, thus, there was no need to change the type of animal feed or medication. However, 96% of respondents mentioned that the price of milk has reduced and, on average, 67% are confident and believe in improvements in the quality produced during and after the pandemic. For 86%, there was a need to change dairy management, 35% needed technical assistance (company technician, veterinarian, insemination service, service for collecting milk samples), and 88% of producers do not intend to abandon dairy activity despite the present scenario.

According to Leite (2020) a continued assistance needs to help in the organization of technologies in efficient production systems and train the producer in the correct management of the technology. Often, it is in the details of managing the technology, in refining its implementation and maintenance, that efficiency is lost and, with it, the possible yield, especially at a time of restrictions, these producers lack this information to stay in the market.

Table 2. Exploratory questionnaire applied to rural properties to understand the effects of COVID-19.

How did the pandemic affect the routine in the evaluated farms:	Yes	%	No	%
1. Did it affect everyday life?	30	58.82	21	41.18
2. Did you have access to raw materials during the pandemic?	43	84.31	8	15.69
3. Did you have to change the brand of feed or type of medication used?	4	7.84	47	92.16
4. Did the dairy industry collect milk during the pandemic?	51	100.00	0	0.00
5. Did you have to resort to any alternatives to reduce animal feed expenses?	12	23.53	39	76.47
6. As for the price of milk during this scenario, do you think that it:				
- Decreased	49	96.08	0	0.00
- Increased	2	3.92	0	0.00
7. Do you think that the quality of milk decreased during the pandemic?	10	19.61	41	80.39
8. Do you have prospects for improvements in milk quality during the pandemic?	33	64.71	18	35.29
9. Do you have prospects for improvements in milk quality after the pandemic?	35	68.63	16	31.37
10. Did you have to change dairy management during the pandemic?	7	13.73	44	86.27
11. Did you need technical assistance during the pandemic?	18	35.29	33	64.71
12. After the pandemic, do you intend to stop dairy farming?	6	11.76	45	88.24
13. Did the dairy industry provide any material on COVID-19 as a means of prevention, contamination, or daily care during the pandemic?	20	39.22	31	60.78
14. Do you expect to increase the volume of milk produced in the coming months?	34	66.67	17	33.33

Source: Authors (2020).

When analyzing the average daily milk production in May 2019 and May 2020, 30 producers (58.18%) registered a decrease in milk production, among them, 12 (23.5%) producers had a reduction ranging from 0.39 to 8.61 liters/day, 13 (25.4) producers had reduction ranging from 10 to 27.4 liters/day, and 5 (9.8%) with a decrease ranging from 31.1 to 79.2 liters of milk/day. Regarding the producers who suffered significant drops in production, 17 (33.3%) are located in Serra Gaúcha and 13 in Taquari Valley. According to Fudemma et al., (2020) creativity and the ability to adapt to new challenges, as well as collaboration with external agents, have contributed to the small Rural Producers not totally succumbing and being able to overcome this very critical period of COVID-19.

According to the hydrometeorological information center at the University of Taquari Valley (UNIVATES, 2020), analysis of the data in Table 3 shows that milk production decreased due to the drought reported by the owners in the first months of 2020 (February to April) compared to the same period in 2019. On average, the rainfall of these three months was 7 days (rainfall of 46.8 mm), causing several counties to declare a state of emergency.

Table 3. Comparison of rainfall recorded from January 2019 to May 2019 with the indexes for the same period in 2020

Period	Average T°	T° Max	T° Min	Rainfall Precipitation (mm)	Days with Precipitation
January/19	26.9	39.5	19.6	135	17
February/19	25	38.4	15.6	120.2	12
March/19	23.1	36.5	13.2	114	15
April/19	21.9	34.7	14	167.4	21
May/2019	19.3	32.6	11.8	216.1	25
January/20	25.7	37.6	13.4	215.4	15
February/20	25.5	37.8	14	79	9
March/20	25.5	39.6	16	21.8	4
April /20	20.8	33.9	9.3	39.6	8
May/20	17.4	31.3	7.4	195	15

T° = temperature in Celsius degrees; Max = maximum; Min: minimum. Source: Univates (2020).

Regarding the structure of the properties for processing the milk, only one property (1.96%) has an immersion tank compared to the other 51 properties, which have expansion tanks. This characteristic is defined in Normative Instruction No. 77 (Brasil, 2018), which recommends some type of pre-cooling system.

As for milking, 7 properties (13.7%) have a milking parlor and the majority (44) of the properties do not have this type of environment, that is, 42 (82.3%) perform bucket-milking and only 9 (17.6%) have channeled milking, all of which have sets of milking machines ranging from 1 to 5 sets. The disinfection of the ceilings, which is known as pre- and post-dipping, is carried out with chemical products and an important tool for preventing mastitis in dairy herds. Despite being considered a good milking practice, only 1 property (1.96%) stated it does not do it. This same property only has 3 milking cows, does not have a specific room for milking, uses only 1 milking set, and has daily production of just 20 liters of milk. All properties have a cooler with sufficient capacity for production storage, with capacities ranging from 150 to 1,500 liters, being 55% of the properties having tanks between 300 and 500 liters.

These requirements of milk production are important as the industries to be benefited by the government program 'More Healthy Milk' (Brasil, 2017a), which allows tax benefits, must adapt and implement a Qualification Plan of Milk Providers (Q) (Brasil, 2018) in order to improve the quality of its products, productivity, and profitability of its activities. Therefore, Normative Instruction No. 77 (Brasil, 2018) determines that the properties linked to the industry must have the minimum conditions necessary for good agricultural practices, among them, the conditions of milking and post-milking, and the adaptation of the facilities, equipment, and utensils for milk production.

4. Conclusion

The exploratory questionnaire revealed worrying characteristics regarding the producers, with the price of milk being the most concerning, in addition to the needs to change milk management and technical assistance during the COVID-19 pandemic.

Regarding the prospect of increasing the volume of milk produced, the producers highlighted some measures, including the acquisition of animals, the birth of heifers, increased number of animals in lactation, the price of a liter of milk, area and/or exchange of milk, pasture, the end of the drought, and increased milking productivity in order not to lose what was invested. Nevertheless, to increase the volume of milk produced in the coming months, the producers described as limiting and negative factors the low price paid for the milk, expensive raw materials, and the lack of labor on the property.

The cases in which the owners needed assistance during the period evaluated included technical assistance, veterinary care, sample collection for milk analysis, and artificial insemination.

The evaluation of the sanitary control of the herd of the 51 properties, based on the report of their owners regarding the performance of tests for tuberculosis and brucellosis in dairy animals, 100% are in accordance with the National Program for the Control and Eradication of Brucellosis and Animal Tuberculosis (BRASIL, 2017b). In the 51 studied properties, a total of 441 milking cows and 136 unproductive cows were registered. Notably, most of the properties have the capacity to cool fresh milk, which is highly beneficial because it stabilizes bacterial multiplication as long as it is monitored.

These requirements regarding milk production on the property are important because the industries to be benefited by the government programs that allow tax benefits must adapt and implement a Qualification Plan of Milk Providers in order to improve the quality of its products, productivity, and profitability of its activities. Therefore, Normative Instruction No. 77 determines that the properties linked to the industry provide minimum conditions of good agricultural practices, among them, milking and post-milking, adaptation of the facilities, equipment, and utensils for milk production.

This exploratory survey involving small-scale milk producers in these two dairy regions in RS is pioneering, since no data were found in the literature that have made this approach. Generally, there is great concern with large-scale milk producers, however, the small-scale producers are the ones who suffer the most in order for the agro-industry not to disappear or become infeasible to continue, which is further enhanced by the pandemic. In this context, it is suggested that further research be carried out in other regions of the state and Brazil in order to have an indicator of viability and maintenance of small agribusiness.

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