

PHYSICAL-CHEMICAL QUALITY OF THE DAIRY MILK GATHERED FROM FLECKVIEH BREED

Roxana Nicoleta Rațu^{1*}, R. Radu-Rusu¹, M.G. Usturoi¹

¹University of Agricultural Science and Veterinary Medicine from Iași, Romania

Abstract

In the current paper we aimed to establish the quality of integral raw milk gathered from Fleckvieh cows breed, through physical-chemical and biochemical analysis. The obtained results, at the end of determinations, were compared with the values indicated in ASRO Romanian Standard, SR 2418:2008 for integral raw milk and with the ones presented in the Guide for rearing of Fleckvieh cows breed.

For establishing the quality we effectuated physical-chemical determinations for fat content the (%), protein titre (%), lactose (%), DM (%), NFDM (%), water content (%), ash (%), density (g/cm³), acidity (°T) and biochemical were made the reductase probe, methylene blue and resazurin method.

For fat content the established mean value was $4.24 \pm 0.064\%$ with 0.44% higher than the indicated value in the breed rearing guide. Regarding protein titre, standard allows a minimum value of 3.2%, rearing guide 3.29% and the value obtained by us was placed at a level of $3.35 \pm 0.008\%$. For lactose the obtained mean was $4.83 \pm 0.011\%$ and regarding the content in NFDM was obtained a mean of $8.84 \pm 0.020\%$.

Generally we can say that milk obtained from Fleckvieh cows breed, reared at Rediu Farm, was in according with the nowadays quality standards.

Key words: milk, Fleckvieh cows, quality, physical-chemical parameters

INTRODUCTION

Human rational nutrition couldn't be conceived without milk and dairy products due to its exceptional nutritive value and accessibility. As first class complete food milk could be fully consider a strategic food, contributing to improvement of life quality and at assuring of food safety by covering the numerous nutritive demands of humans. Physical-chemical speaking, milk represents a very complex heterogeneous liquid, each component being responsible for a certain characteristic [1], [2], [4], [5].

At world level, consumption of milk and dairy products per capita represents an important indicator for life standard so in the advanced countries milk production represent 30-40% from gross income realized by agricultural production [12].

Milk is one of the basic food for humans, as well as raw material for a various scale of

products, for alimentary usage and also for industrial utilisation [7], [12].

Quality of the raw milk depends on its microbial density and various factors effect on the number and types of micro-organisms in raw milk [3], [6].

Assuring of raw material with a superior quality have a remarkable importance, on that one depending obtain of products with a high quality as well as realisation of a superior index for capitalization of raw material. So, in the current paper we aimed to realise a qualitative analysis of milk raw material gathered from Fleckvieh cows breed, reared at Rediu Farm.

MATERIAL AND METHOD

Qualitative reception of milk was daily effectuated in period 24.02–10.03.2017, gathering samples on which were determined: fat content (%), dry matter (DM), non-fat dry matter (NFDM) (%), water content (%), lactose (%), ash (%), protein titre (%), acidity (°T) and density (g/cm³).

*Corresponding author: roxana.ratu@gmail.com

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Determination of **fat content** was realised using acid-butyrometric method (dissolution of protein substance from milk in the presence of sulphuric acid and fat separation by centrifugation, using heat and isoamyl alcohol) [9].

Dry matter was determined by oven drying method [8].

Water content was established by difference using the formula:

$$\text{Water}(\%) = 100 - \text{DM}(\%) \text{ [8].}$$

Non-fat dry matter (NFDM) was determined by using the relation:

$$\text{NFDM}(\%) = \text{TDM} - \text{G}$$

where TDM = total dry matter and G = fat content of milk [13].

Content of lactose was determined by potassium ferrocyanure method [13].

Milk density was determined with a thermo-lacto-densimeter, this physical parameter representing the rate between milk mass at +20°C and mass of the same water volume at a temperature of +4°C [11].

Ash determination is usually realised by calcinations of samples in given conditions, by slow method at 550°C (reference method) [13].

Protein titre was determined by Schültz method, which is based on milk treating with formic aldehyde which blocks the amino groups of proteins, and free carboxylic groups could be titre with a solution sodium hydroxide (0,143 N), so the result will be directly expressed in percents [13].

Acidity was determined by using Thörner method [10].

The obtained data after laboratory tests were statistically processed calculating: arithmetic mean, variance, standard deviation, mean standard deviation and variation coefficient.

RESULTS AND DISCUSSIONS

Milk gathered from **Fleckvieh cows breed** indicated good qualitative values in comparison with quality standard. So, for fat content we obtained a mean of $4.24 \pm 0.064\%$, the imposed minima by standard being 3.2%. Regarding the studied character this one presented a very good homogeneity, the value of variation coefficient being 4.743% (tab. 1).

Table 1 Physical-chemical parameters for milk raw material

Nr.	Analysed parameter	$\bar{X} \pm s_{\bar{x}}$	V%	Values indicated by standard
1	Fat (%)	4.24 ± 0.064	4.743	Min. 3.2
2	Dry matter (%)	12.68 ± 0.079	1.979	12.5
3	Water (%)	87.32 ± 0.079	0.287	87.5
4	Non-fat dry matter (%)	8.84 ± 0.020	0.721	Min. 8.5
5	Protein titre (%)	3.35 ± 0.008	0.721	Min. 3.2
6	Lactose (%)	4.83 ± 0.011	0.724	4.6 – 4.7
7	Ash (%)	0.67 ± 0.005	2.235	0.9
8	Acidity (°T)	16.4 ± 0.221	4.263	15...19
9	Density (g/cm ³)	1.0300 ± 0.0002	0.050	Min. 1.029

For DM content was obtained a mean of $12.68 \pm 0.079\%$ difference till 100% being represented by water, also in this case, both parameters being inside the values imposed by standard.

For NFDM content, standard SR 2418 referring to integral crude milk indicate a minimum value of 8.5%, the mean obtained by us being higher with 0.34%. The studied character presented a very good homogeneity also in this case ($V=0.721\%$).

Regarding protein content, mean was at a level of $3.35 \pm 0.008\%$ higher with 0.15% in comparison with the value indicated by standard.

For lactose content the mean calculated by us was $4.83 \pm 0.011\%$ and the value of variation coefficient reached 0.724% fact which indicates a very good homogeneity of batch.

Regarding ash content the mean value was $0.67 \pm 0.005\%$. The studied character had

a very good homogeneity, value of variation coefficient being 2.235%.

To highlight the milk freshness state, acidity was determined by titrating method. The mean obtained value was $16.4 \pm 0.221^\circ\text{T}$, admissible limits indicated in standard for this parameter being between $15...19^\circ\text{T}$.

For density we obtained a mean value of $1.0300 \pm 0.0002 \text{ g/cm}^3$ indicated by SR 2418 regarding integral crude milk being of 1.0290 g/cm^3 .

CONCLUSIONS

Generally we can say that milk produced at Rediu Farm, was in according with the norms imposed by the quality standards.

So, for fat content the mean value obtained by us was higher with 1.04% in comparison with the minimum indicated by SR 2418.

Regarding DM content, this one recorded a level higher with 0.18% face to standard, while water content was lower with 0.18% in comparison with standard.

For NFDm content the mean obtained by us had a value higher with 0.34% face to minimum indicated by standard and for protein titre we obtained a mean higher with 0.15%.

Content in lactose varied between 4.6 and 4.7%, the value obtained by us being 4.83%.

Acidity and density of analysed milk were also inside the values indicated by SR 2418.

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