The Phenotypical Correlations between Somatic Cell Count and Principals Characters of Cow Milk Production for Falticeni Area

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Abstract
Researches were making on cow milk samples from three Falticeni area loclities. Studied characters were mill production, fat percent, protein percent, and somatic cell count. There were analyzed the milk samples with SOMACOUNT to "Dorna Lactate" and dates have been discussed with MATLAB program. The phenotypical correlation values have been varied between +0,356 ÷ +0,542 for fat percent and protein percent; +0,080 ÷ +0,218 for fat percent and somatic cell count, -0,005 ÷ +0,117 for protein percent and somatic cell count; +0,012 ÷ +0,226 for milk production and fat percent; -0,643 ÷ +0,010 for milk production and protein percent and -0,467 ÷ -0,114 for milk production and somatic cell count.

Keywords: fat content, milk cow, phenotypical correlation, protein content, somatic cell count.

1. Introduction

There is well known that „the milk cells belong the hygienic quality indexes category of milk for human consumption" [1, 2, 3, 4]. That is why the importance and signification of milk somatic cells is an agreed univocal desideratum for the consumer integrity.
There is used frequently the somatic cell count like early indicator for mastitis presence and it use less like quality indicator. That is why the research aim was to colligate between elements of milk quantity and quality: somatic cell count, fat content, protein content and milk production.

2. Materials and methods

The analyzed samples were from cow milk from Falticeni area. The milk has been gathered to Cornu Luncii, Preutesti and Vadu Moldovei centers and samples have been draw from purchase milk.
66,69 thousand hl milk have been gathered from 29469 dairy cows belong area. There were 5735 cows Bruna breed, 4973 cows Baltata romaneasca breed, 1903 cows Baltata cu negru romaneasca breed and 76 cows Pinzgau de Transilvania and 7242 dairy cows hybrid from Bruna, 7602 cows hybrid from Baltata romaneasca, 1871 cows hybrid from Baltata cu negru romaneasca and 67 cows hybrid from Pinzgau de Transilvania.
20155 samples have been gathered from that milk and the fat content, protein content, somatic cell count have been determined with Somacount apparatus in Dorna Lactate laboratory.
The obtained results have been statistical discussed and have been found the phenotypical correlation values between milk production, fat content, protein content, somatic cell count (the studied characters). MATLAB program was use for discussed results.

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3. Results and discussion

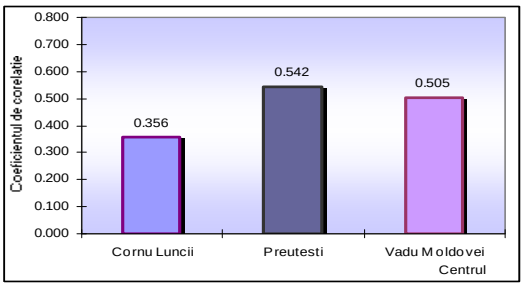
The milk samples analysis and results processing show us the fat content and protein content are positive correlated (table 1). These characters are medium positive correlated with values between +0,2 ÷ +0,4 to Cornu Luncii center and they are high positive correlated to Preutesti and Vadu Moldovei centers (with values more than +0,5 (figure 1a).

Table 1. Correlations between studied characters, in Falticeni area

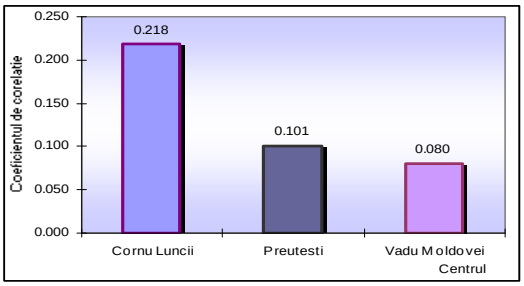
Centrul	Correlation values between:					
	F – P	**F – SCC**	**P – SCC**	**MP– SCC**	**MP – F**	**MP – P**
Cornu Luncii	0.356	0.218	-0.005	0.226	-0.643	-0.114
Preutesti	0.542	0.101	0.117	0.012	0.01	-0.467
Vadu Moldovei	0.505	0.080	0.075	0.216	-0.295	-0.371
Total area	0.533	-0.247	-0.027	0.269	-0.440	0.121

F= Fat content;
P = Protein content;
SCC = Somatic cell count;
MP = Milk production.

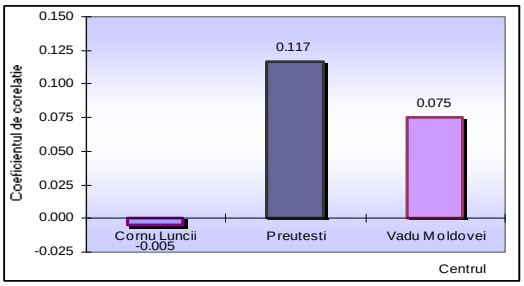
The milk fat content and milk somatic cell count were low correlated positive. These characters are low positive correlated to all centers (Cornu Luncii, Preutesti, Vadu Moldovei) with values between 0 and +0,2 (table 1 and figure 1b).
The milk protein content and somatic cell count are two characters low positive correlated to Preutesti and Vadu Moldovei centers. They are low negative correlated to cornu Luncii (-0,005) (table 1 and figure 1c).
Milk production and milk fat content are high negative correlated to Cornu Luncii center (–0,643). These characters are medium negative correlated to the Vadu Moldovei center (–0,295) (table 1 and figure 1d).
The milk production and the milk protein content are medium negative correlated to the Vadu Moldovei center (-0,371) and they are low negative correlated to the Cornu Luncii center (-0,114). Preutesti is only center where these two characters are medium to high negative correlated (–0,467) (table 1 and figure 1e).
In this area, milk production and milk somatic cell count are low positive correlated to only the Preutesti center (+0,012). These characters are medium positive correlated to all of the other centers (Cornu Luncii: +0,226 and Vadu Moldovei: +0,216) (table 1 and figure 1f).
The dates from entire area was used to calculate correlation and we found +0,533 value between milk fat content and milk protein content. The results shows us this value is to nearly to specialty literature values (+0,3÷+0,6) (3, 4, 1).
The correlation values found between milk production and milk fat content are –0,440, more higher to the values from specialty literature which are between –0,08 and –0,25 [4, 1].
These results regarding on milk production and milk protein content correlation (+0,121) are mostly between values from specialty literature (–0,18÷–0,24) [4, 1, 5].
In accordance with information from studied bibliography, the milk somatic cell count and milk production are low to medium positive correlated (+0,12÷+0,17). The milk somatic cell count and the milk fat content are very low negative correlated (–0,04 ÷ –0,14) as well as milk somatic cell count and milk protein content (–0,02÷–0,14) [6, 1, 7, 8].
Those 20155 analyzed samples have been use to calculate the correlation between milk production and milk somatic cell count. The correlation value is +0,269 for entire area, higher than specialty literature values.
Between milk somatic cell count and milk fat content is a very medium to high negative correlation (–0,247) (higher than literature values) for entire area, but correlation values for all 3 centers are low positive.
Milk somatic cell count and milk protein content are low negative correlated (–0,027) for entire area, between specialty literature values.



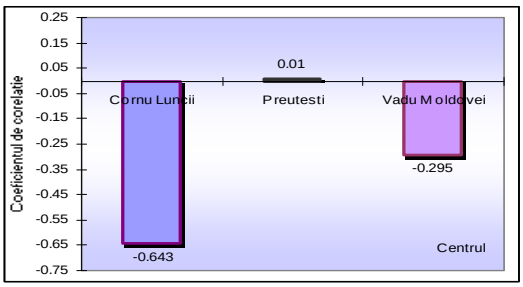
a) Fat– Protein



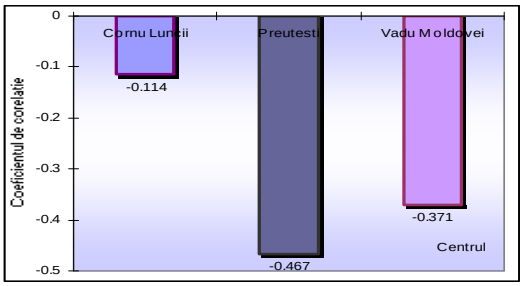
b) Fat – Somatic cell count



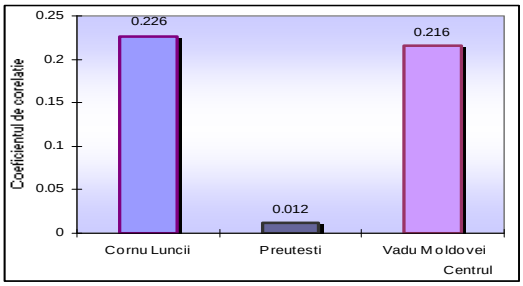
c) Protein – Somatic Cell Count



d) Milk production – Fat



e) Milk production – Protein



f) Milk production – Somatic cell count

Figure 1. Correlations between sudied characters, in Falticeni area

4. Conclusions

In Falticeni area, the phenotypical correlation values are:
- +0,356 ÷ +0,542 to center and +0,533 to entire area between milk fat content and milk protein content;
- +0,080 ÷ +0,218 to center and –0,247 to entire area between milk fat content and milk somatic cell count;
- –0,005 ÷ +0,117 to center and –0,027 to entire area between milk protein content and milk somatic cell count;
- –0,643 ÷ +0,010 to center and –0,440 to entire area between milk production and milk fat content;
- –0,467 ÷ –0,114 to center and +0,121 to entire area between milk production and milk protein content;
- +0,012 ÷ +0,226 to center and +0,269 to entire area between milk production and milk somatic cell count.

Though the limits values are lower or higher than specialty literature, the most results are between known correlations for studied characters.

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