

Relation of Reproduction Indicators from the Structure of Nutrition Ration in Cows of Dairy Farms			Healthcare
			Keywords: Total energy, metabolized energy, service period, copulation index.
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Abstract			
<p>In five cows farms with over 25 cattle heads were studied relations of the reproductions indicators from the structure of nutrition ration. Indicators of the paraservice period (PSP), service period (SP) and of the average copulations index (CI) were matched with quantity indicators of nutrition ration, amount of the dry matter (DM), amount of hard fermentable fibres (CF), easily fermentable fibres (NDF), with total metabolic energy (FME) and metabolized energy (EM). Obtained data, after grouping and statistically analysis, showed that there is dependency relation among indicators. Most important negative correlative relations were between service period (SP) and the copulation index (CI) with the level of the metabolized energy (EM), ($r = -0.387$ and $r = -0.427$) and with the total energy (FME) in ration ($r = -0.370$ and $r = -0.412$). Paraservice period (PSP) seems to be unaffected by the composition and structure of nutrition ration.</p>			

1. Introduction

There is always a correlation between the exact feeding and fertility indicators, *Duffield T.F. (2000)*. Nutrition affects the fertility of the cows, especially during the first three months after calving. In almost 50 % of cases indicators of hypo-fertility depend from dietary mistakes and this was and is a current topic of increasing interest for specialists and farmers. Defects in nutrition that reflects the fertility of cattle in a farm usually are more than one. They are connected with mistakes in calculation of ingredients in ration, from shortages and incorrect administration of foods harmful to fertility. Almost always, nutrition mistakes are highlighted and conditioned also from other subsequent factors such is high productivity of milk (which required high level of nutritive elements), breed, environment, overall condition, etc.

Decreased fertility indicators in farm cows due to nutrition reasons are especially manifested with repeated oestrus, in most cases caused by the early embryonic death (6 - 7 days) or long estral cycles and return of oestrus after 25 - 38 days due to late embryonic deaths.

A study was conducted with the aim to clarify correlation of the nutrition ration structure with reproduction indicators in actual condition in dairy farm cows, results of which are given bellow.

2. Material and Method

The study was conducted in the period March 2014 until March 2016. For the study were coincidentally selected five cow farms with over 25 cattle heads and which had a type of all year around nutrition system. The structure and consistency of nutrition ration given to cows were studied using table method according to *McDonald (1995)*. Into consideration were taken indicators of physical quantity of the ration, amount of dry matter (DM), amount of hard fermentable fibres (CF), easily fermentable fibres (NDF), total metabolic energy (FME) and metabolized energy (EM). From the reproduction indicators, for comparison were selected the period in days from the calving until the first oestrus (para service period), the period in days until the efficient copulation (service period) and index of copulation (IN) per impregnated cow. Reproduction indicators were calculated with standard method. Obtained data were statistically analysed and correlations were calculated at the end, correlative relations between indicators in the study and equations of the one-factorial regress between quantity and quality indicators.

3. Results and Discussion

Nutrition rations used in the experiment period in five farms provided the parameters of the structure as shown in table 1. Calculations were made using the table method according to Animal Nutrition by *McDonald, (1995)*.

Farm	Structure of nutrition rations used in the farms of the study					
	Kg.	DM	CF	NDF	ME	FME
A	30	16.52	6.2	12.32	318.4	285
B	37	15.07	9.19	8.18	391.7	353.8
C	25	17.75	4.95	6.08	228	208.1
D	33	15.65	6.52	13.87	436.4	401.9
E	34.5	17.1	6.64	13.61	380.1	340.7

Table 1: Structure of nutrition rations given to cows in the farms subject of the study.

From table 1 it seems that changes in the structure of nutrition rations are more in the total amount, amount of hard fermentable fibres and the amount of metabolized. For the study period, in the herds of cows were conducted reproduction indicators, as shown in table 2.

Farms in the study	Indicators			
	P/service P	S. Period	I. copulat.	% fertility
A	48	152	2.7	68
B	51	128	1.9	78
C	48	131	2	78
D	54	127	1.8	82
E	47	125	1.7	83

Table 2: Main reproduction indicators in cows carried in the study farms

After analysing the obtained data, correlative relations were prepared between indicators in the study, shown in table 3.

Reproduction indicators	Components of the nutrition ration				
	DM	CF	NDF	ME	FME
P.s.period	- 0.166	0.142	0.198	0.265	0.299
S. Period	0.101	- 0.241	0.071	- 0.370	- 0.387
I. copul.	0.083	- 0.222	- 0.023	- 0.412	- 0.427

Table 3: Correlation coefficients of reproduction indicators in cows with the structure of the nutrition ration.

From the study it seems that the paraservice period (PSP) is almost uninfluenced from the composition and the structure of the nutrition ration. Other researchers came to such conclusions too, *Coffey M.P. et al. (2002)*. Most visible relations, of negative character, were between indicators of the service period (SP) and copulation index (CI) with the level of the metabolized energy (EM) (respectively, $r = - 0.387$ and $r = - 0.427$).

Other researchers have as well reached such conclusions, who assessed the role of energetic content in the ration with the health of the cattle in general, and in particular the reproductive one, *Anderson L. (1993); Ceroni V. e bp. (2010). Radostits O. M. et al. (2005); Oikonomou G., et al. (2008)*. Most interesting correlations between indicators in studying the quantity of the metabolized energy in the ration with the service period and copulation index, are given in the below charts of linear regress.

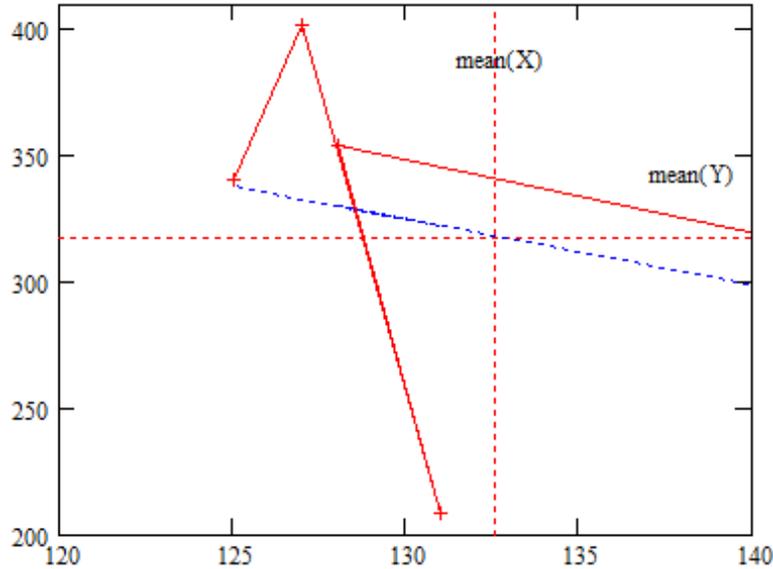


Chart 1: Correlation between metabolized energy in the ration with service period. The blue line shows the tendency of the correlative connection of the negative character. ($r = - 0.387$).

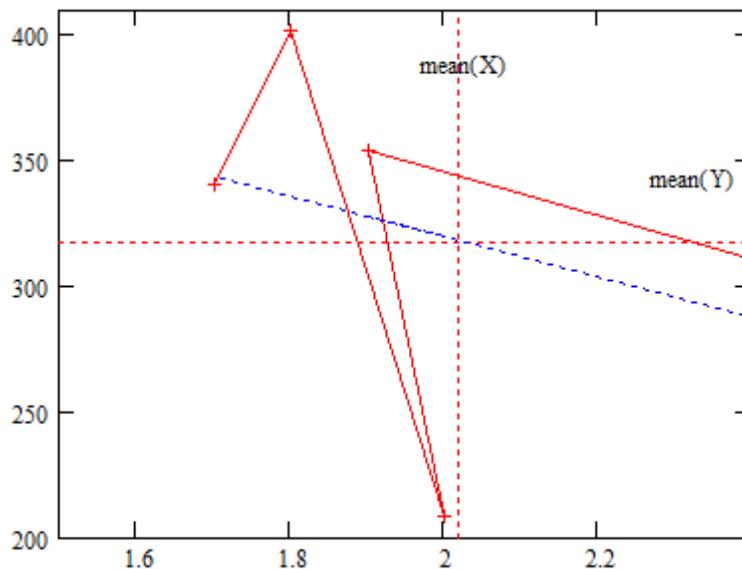


Chart 2: Correlation between the quantity of the metabolized energy in the ration with the copulations index. Blue line shows the tendency of correlative connection and negative character. ($r = - 0.427$).

Relations to be assessed are those between the level of the total energy (FME) in the ration with service period (SP) and the copulations index (CI) (respectively, $r = -0.370$ and $r = -0.412$). Correlations between indicators of the total energy in the ration with the service period and copulations index, are given in the below chart of linear regress.

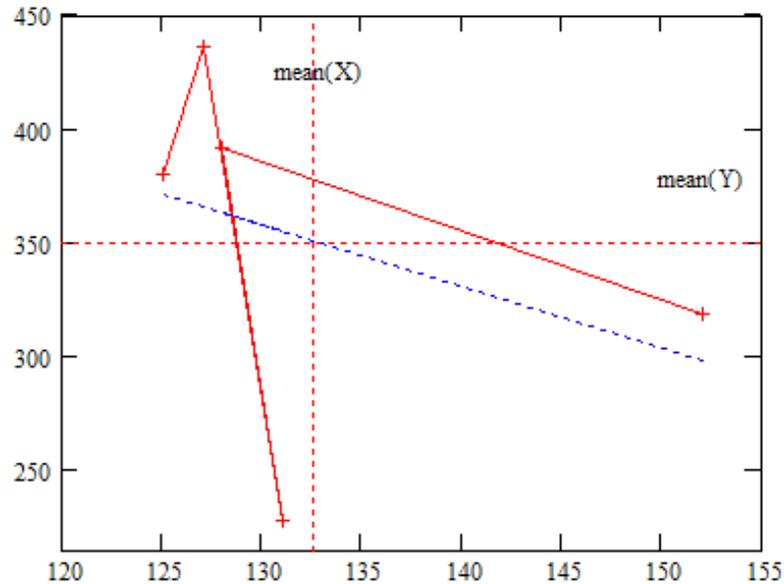


Chart 3: Correlation between the total quantity of energy in the ration with the service period. Blue line shows the tendency of the correlative connection. ($r = -0.370$).

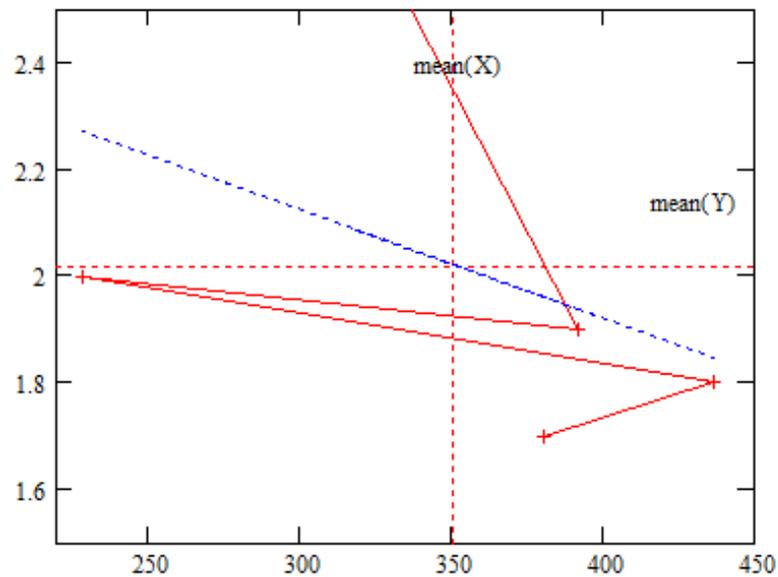


Chart 4: Correlation between the total quantity of energy in the ration with copulations index. Blue line shows the tendency of correlative connection. ($r = -0.412$).

From the research data showed on table 3, it seems that relations of the quantity indicators of the nutrition ration (quantity of dry matter (*DM*), *quantity of hard fermentable fibres (CF)* and *the amount of easily fermentable fibres (NDF)*) with reproduction indicators are weak. From the study it seems that reproduction indicators in cows are less influenced by the quantity of dry matter in the ration. The quantity of hard fermentable fibres seem to have weak effect and of negative character on the indicators of reproduction.

4. Conclusions

- Structure and composition of the nutrition ration are most assessed elements in feeding cows.
- From indicators of nutrition ration structure in cows it seems that strongest effect in reproduction indicators has the composition of the total energy of the ration (FME) and quantity of the metabolized energy (EM).
- From the reproduction indicators, paraservice period (PSP) seems to be uninfluenced by the structure and composition of the nutrition ration.
- Influence in reproduction indicators has also the report between the quantity of hard fermented fibres with the quantity of easily fermented fibres.
- Structure and composition of nutrition ration in cows should be constantly followed and matched also with reproduction indicators.

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