

THE RELATIONSHIP BETWEEN REPRODUCTION INDICATORS AND THE STRUCTURE OF FOOD RATION, IN THE DAIRY COWS FARMS

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Abstract

There is always a correlation between the exact feeding and fertility indicators [1]. Nutrition affects the fertility of the cows, especially during the first three months after calving [2, 6]. 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 [7]. The study aims to clarify the relationship between food ration structure and reproduction indicators, in concrete breeding conditions in cows' farms for milk production.

During the period March 2015 - March 2016, relationship between reproduction indicators and the structure of feed rations in five cows' farm, with each over 25 cows were studied. The indicators of pre-service period (PSP), days open (DO) and the average index of copulation (IC), were confronted with mineral content of elements calcium (Ca), phosphor (P) and magnesium (Mg). The reproduction indicators were calculated with the standard methods, meanwhile the mineral content elements in the food rations were calculated according to McDonald [7]. The data obtained were processed statistically with ANOVA method and were prepared graphs of linear regression.

After grouping and statistical development, gained results indicated that there is a relationship between the indicators we were studying. The strength relationships was found between open days (OD) and copulation index (IC) with the level of Ca in the food ration ($r = 0.840$ and $r = 0.832$ respectively). Pre service period seems to be unaffected from the composition and structure of feed rations. Relationships which have to be evaluated too, are between the level of P with days open (DO) and copulation index (IC) ($r = -0.397$ and $r = -0.454$ respectively). The results are indicating that levels of Mg seems to be insignificant for the days open indicator and the pre service period ($r = 0.124$ and $r =$

-0.211). Our data are approximately the same with the conclusions of other authors.

In cows feeding, the structure and the composition of the food rations are the most estimated elements. From the indicators of the structure of food ration in cows, seems that a stronger impact in reproduction indicators has the content of CA and P. Pre-service period (PSP) seems to be not affected by the structure and composition of the food ration. The composition and content of mineral elements in the food ration can be used for prognostic purposes.

Key words: Days open, Pre-service period, Index of copulation, Ca, P, M.

1. Introduction

There is always a correlation between the exact cow feeding and fertility indicators [2, 4]. In almost 50 % of cases, indicators of hypo-fertility depend from dietary mistakes, and this problem was and is a topic of increasing interest for specialists and farmers [7].

Defects in nutrition that reflects the fertility of cattle in a farm usually are more than one [1]. They are connected with mistakes in calculation of ingredients in ration, shortages, and incorrect administration of foods harmful to fertility [1, 3, 5]. Almost always, nutrition mistakes are highlighted and conditioned also from other subsequent factors such as: high productivity of milk (which required high level of nutritive elements), breed, environment, overall condition, etc. [3, and 5]. Decreased fertility indicators in cows' farm 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 [6].

This study was conducted with the aim to clarify correlation of the nutrition ration structure with reproduction indicators in actual condition in cows' dairy farm.

2. Materials and Methods

The study was conducted during the period March 2015 to March 2016. For the study were chosen five cows farms with over 25 cows who had perennial type of food system, and relationship between reproduction indicators and the structure of feed rations have been studied.

The indicators of pre-service period (PSP), days open (DO) and the average index of copulation (IC), were confronted with mineral content of elements calcium (Ca), phosphor (P) and magnesium (Mg). The reproduction indicators were calculated with the standard methods, meanwhile the mineral content elements in the food rations were calculated according to McDonald [7]. Obtained data were processed statistically with ANOVA method and were prepared graphs of one factorial linear regression.

3. Results and Discussion

Food rations used in the experiment in five farms (A to E), contained Ca, P and Mg as shown in Table 1. The amount of contents of mineral elements in the food ration was estimated according to the data in the Animal Nutrition tables [7]. Data on the average value of the food ration indicators are given in Table 1.

From Table 1 it can be seen that there are differences between farms in the physical quantity of feed and in the daily contents of mineral elements Ca, P and Mg in the food rations. It appears that in the food rations structure most significant changes are in the amounts of Ca and P.

For the period under study (March 2015 to March 2016) in herds of they were followed cows reproduction indicators, or more precisely the indicators of Pre Service Period (PSP), Days Open (DO), and Index of copulation (IC) and percentage of fertility in each farm (Table 2).

As can be seen from Table there are significant differences between the aforementioned indicators between different cow farms.

This research aim was discover the relationship between the elements content of Ca, P, Mg and the reproduction indicators. So, after processing the data obtained for the average content of Ca, P and Mg in the cows ration feed and the main cows reproduction indicators at all farms, we performed a simple student test to shown the correlative relationships between the indicators in the study (Table 3).

Table 1. The content of mineral elements in the food ration of cows on farms in the study

Farms	The amount of feed and the content of mineral elements according to farms				
	Amount (kg)	Dry matter (kg)	Ca (g)	P (g)	Mg (g)
A	30	16.52	286.3	88.7	50
B	37	15.07	225.6	103.2	50.15
C	25	17.75	237	70.4	45
D	33	15.65	200	107.1	44.7
E	34.5	17.1	242.9	107.6	50.6

Table 2. The main indicators of reproduction conducted on farms in the study

Farms	Indicators			
	PSP	DO	IC	% of 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 3. The correlation coefficients between indicators in the study

Indicators	Components of the food rations		
	Ca	P	Mg
PSP	- 0.144	0.257	- 0.211
DO	0.840	- 0.397	0.124
IC	0.832	- 0.454	0.237

PSP (pre-service period); DO (days open); IC (index of copulation).

*: Significant changes, compared to the control group ($p < 0.05$ level).

Gained data indicates that the amount of the content of Ca, P and Mg in the food ration has affected the reproductive indicators. The degree of influence is different. It seems that the greatest impact has Ca and a little impact amount of P. It seems that amount of Mg have no effect in the reproduction indicators. Such conclusions had been reached by other authors [2, 3, and 5].

From the study, pre-service period (PSP) seems to be not affected by the structure and composition of the food ration. The strength relationships, of positive character, was found between days open (DO) and copulation index (IC) with the level of Ca in the food ration ($r = 0.840$, and $r = 0.832$ respectively). Relationships which have to be evaluated too, are between the level of P with days open (DO) and copulation index (IC) ($r = -0.397$ and $r = -0.454$ respectively).

The most interesting relationships are provided in linear regression charts (Figures 1, 2 and 3). Blue line shows the relationship between the indicators.

Correlative relationship between the level of Ca in the food ration and days Open (DO) are shown in Figure 1.

As can be seen from the Figure 1, between these two indicators is a strong relationship of positive character, which means, that the amount of Ca in the feed ration has a powerful impact on the realization of the cows pregnancy.

Relationship like this are between the level of Ca and the index of copulation is presented in Figure 2.

Between these two indicators are strong relationships with positive character, which means, the amount of Ca in the feed rations has a powerful impact on the cows pregnancy.

Figure 3 shows the correlative relationship between the amount of P in feed ration and the Index of copulation.

Between the two indicators, the relationships are moderately strong and have negative character, which means, that the index of copulation in cows decreases when the amount of P increase in the food ration.

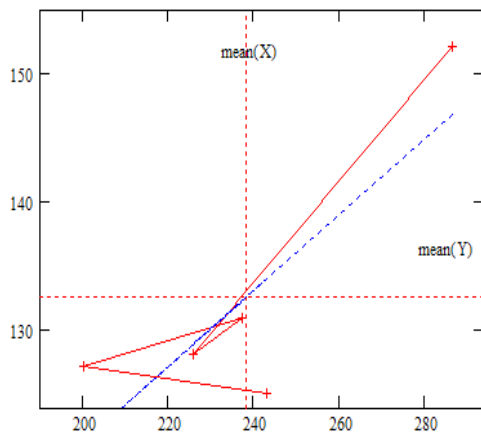


Figure 1. Relationships between the level of Ca in the food rations with Open days (OD) ($r = 0.840$)

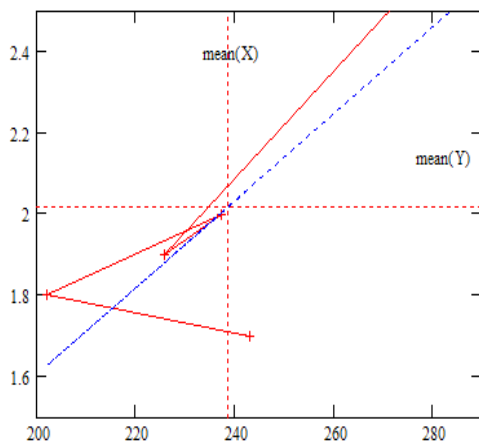


Figure 2. Relationships between the level of Ca in the food ration and the index of copulation (IC) ($r=0.832$)

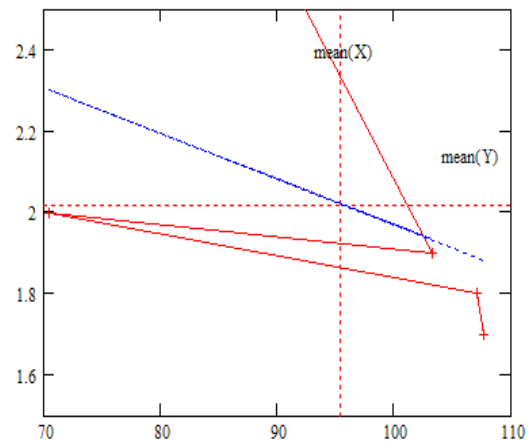


Figure 3. Relationships between the level of P in the food ration and the index of copulation ($r = -0.454$)

4. Conclusions

- In cows feeding, the structure and the composition of the feed rations are the most investigated parameters because they have influence on cow farms performance.
- From the indicators of the structure of food ration in cows, a stronger impact in reproduction indicators has the content of Ca and P.
- Pre-servis period (PSP) seems to be not affected by the structure and composition of the feed ration.
- The structure and the content of food ration in cows must be followed consistently and faced with reproduction ratios.

5. References

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