

<p align="center"><b>Biotine Supplement in Food Ration and Reproductive Performance in Cows for Milk Production</b></p>		<p align="center"><b>Healthcare</b></p> <p><b>Keywords:</b> Biotin, glucose, pre service, days open, index of copulation.</p>
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<p align="center"><b>Abstract</b></p> <p>In four cow groups, was applicated biotin treatment with different doses, one month before and two months of post partum. The Cows were monitored for blood glucose levels and Reproduction indicators presevis period (PSP), Days open (DO) and index of copulation(IC). For Comparisons were monitored the same indicators in controls groups. The cows which was Treated with biotin had a higher level of glucose in blood.The difference was up to <math>3.4 \pm 3</math> mg%. Biotin supplementation in the transition period in cows showed positive effects in some reproduction indicators. The days open and the index of copulation were the most affected indicators.preservice period was not affected from biotin in supplementation.In groups treated with biotin was realized days open with <math>28.74 \pm 0.42</math> days less was achieved, while the index of copulation was with <math>0.64 \pm 0.12</math> less copulation for pregnant cows. Between Reproduction indicators and usage of biotin doses has strog correlative relation of negative character (ie <math>r = - 0.531</math> for p And <math>r = - 0.603</math> for the stock index).</p>
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## 1. Introduction

Production growth and the improvement of reproductive indicators remains the basic objectives in dairy farms for milk production, Ceroni V. ebp. (2008, 2014). The factors which indicate the realization of these objectives are many and are Related to the racial composition of cows, feeding, and with breeding conditions too. Many studies had evaluate the role of various factors. Our study is directed at the impact of the Biotine Supplement in Feeding Cows for Milk Production.

Biotin (or Vitamin H) is part of the vitamin B group and is water soluble. Biotin is present in plants of the nutritional diet of cows, but it can be synthesized in rumen in Different amounts , depending on the composition of the food ration, Bergsten C. and bp. (2003), Bradfofd P. Smith, (2002), Radostits O.M. And bp. (2005). In cows, biotin is a cofactor key in enzymes which are necessary for gluconeogenesis, lipogenesis and protein synthesis. Influencing in various metabolic processes, biotin shows positive growth in milk production, Bradfofd P. Smith, (2002), Ceroni V. and bp. (2005) and improving the reproduction indicators, Radostits O.M. And bp. (2005), Ceroni V. and bp. (2011).

The purpose of this study was to evaluate the effect of biotinic supplementation in improving cow reproduction indicators for milk production in the conditions of their breeding in farms.

## 2. Material and Method

### 2.1. Farm's Selection for study

The study was conducted in four cows' milk farms in the Region of Fier between January 2015 and September 2016. For this study were randomly selected farms with over 50 head cows of different breeds

### 2.2. Cows's selection for study

In each farm, were organized 10 experimental and control groups Animals Groups were chosen with the principle of coincidence with an equal number, from 3 to 9 years old and in the last period of pregnancy (in the drying period). The groups of cows in the experiment were treated in the same environment of the stables, while respecting the equal conditions of breeding and feeding.

### 2.3. Preparation and experiment

After formation of the groups, Biotine supplement was added to the concentrated food of experimental cows in with different doses according to farms. In a farm (A) biotin was used with 5 mg / head daily, another (B) with 10 mg , On the third farm (C) of 15 mg and on the fourth farm (D) was applied a dose of 20 mg / head. Treatment with the Boitin preparation as a supplement was applied consistently, one month before calving and two months of postpartum. The preparation was given to the cowsin concentrated food, twice a day. Mixture of concentrated food was realized in farm premises. The cows of experimental groups for control were fed and milked by the same employees.

### 2.4. Sampling

From the cows of the experimental and control groups, the following indicators were followed:

- Blood glucose level. The evaluation was performed by the rapid method from a blood drop taken from the ear veins, every 2 weeks, in the one month of passage and up to 2 months after calving.
- Reproduction Indicators (Pre service period (PSP), Days Open (DO) and Index of Copulation (IC)). The average values of the indicators were calculated by standard methods.

## 2.5. Statistical analysis

The Data obtained from periodic controls were grouped and were calculate the averaged values by using the simple mathematical method. For specific indicators (for more than 30 the Fited values) the data was statistically processed by using the student test. For each indicator, was calculated the mean value (M), the average error ( $\pm m$ ), the standard deviation ( $\sigma$ ) and the truth of variation (tD) for the comparative indicators in the cows groups were calculated. For specific indicators, were calculated correlations with correlation coefficients and were coposed the graphs of linear dependence between factor.

### 3. Results and Discussion

#### 3.1. Blood glucose level

The average level of blood glucose for the period of one month before calving and up to two months postpartum (every 2 weeks) in the experimental and control cows, after grouping and statistical processing of the data obtained is given in Table 1.

Table 1. The average level of blood glucose in the experimental cows groups

Cows group	Control period and blood glucose level mg% (M ± m)				
	2 week before calving	Postpartum			
		2 week	1 month	1.5 month	2 month
experiment	46.7 ± 2.8	49.2 ± 4	47.3 ± 7	48.2 ± 3	50.5 ± 5
control	47.6 ± 2.2	49.1 ± 2	46.6 ± 3	46.3 ± 3	47.1 ± 2
<b>Difference</b>	<b>- 0.9 ± 0.6</b>	<b>+ 0.1 ± 2</b>	<b>0.7 ± 4</b>	<b>+ 1.9 ± 0</b>	<b>+ 3.4 ± 3</b>

The blood glucose level indicator measured by the rapid method of blood drope from the ear veins is significantly altered and apparently influenced by the use of the biotin supplement. Throughout the study period, the blood glucose level was higher in experimental cows groups with differences from 0.1 to 3.4 mg%. The differences are statistically verified (P <0.05). In cows of all groups was detected a decrease in blood glucose levels in the first month of lactation. Such an occurrence is related to the increased level of milk production, *Ceroni V. and bp. (2011)*. Increased blood glucose levels in animals treated with biotin supplement is reported by other authors, *Abel, H.J., and bp. (2001)*, *Bergsten C. and bp. (2003)*, *Butler, W. R. (2000)*, *Ceroni V. ebp. (2005, 2014)*.

#### 3.2. Reproduction indicators

The reproduction indicators, Pre service period (PSP), Days Open (DO) and the index of copulation (IC), were calculated for experimental and control group of cows after confirmation of pregnancy result with the rectal control. The data obtained were grouped by groups and processed statistically. Table 2 gives final results.

Table 2. Reproduction indicators gained in the cows of the groups in the study

Cows groups	Treguesit e riprodhimit të realizuar(M ± m)		
	Pre service period (days)	Days Open (days)	Index of copulation IC/Pregnant cows
Experiment	78.12 ± 4.16	105.41 ± 6.13	1.61 ± 0.1
Control	81.23 ± 3.31	134.15 ± 6.55	2.25 ± 0.22
<b>Difference</b>	<b>- 3.11 ± 0.85</b>	<b>- 28.74 ± 0.42</b>	<b>- 0.64 ± 0.12</b>

Reproduction indicators most influenced by biotin supplementation appear to be the Days Open (DO) and the index of copulation (IC). The PSP does not seem to be affected by the use of biotin as a food supplement.

*Bergsten C. and bp have reached such conclusions. (2003) in a study published in 2003.* In Cows of the experimental groups, was performed average Days Open (DO)  $105.4 \pm 6.13$  days versus  $134.15 \pm 6.55$  days in control groups of cows, or less  $28.74 \pm 0.42$  days (almost 1 month). Changes in days Open interval values between groups are statistically verified ( $P < 0.05$ ). Cows of the experimental groups were fecundated with average of  $1.61 \pm 0.2$  insemination versus  $2.25 \pm 0.22$  inseminations in control cows, or less  $0.64 \pm 0.12$  inseminations for pregnant cows. Changes in the values of the index of copulation are not statistically verified ( $P > 0.5$ ). Even in the cows of the experimental groups, were noted changes in the values of the reproductive indexes that in our opinion are related to doses of biotin use, but based conclusions require further study.

### 3.3. The Correlations and Dependencies of the Indicators in the Study

For some of the indicators gained in the experiment and which in our opinion were significantly influenced by biotin supplementation in food, were also established linear regression graphs to evaluate the degree of correlation and correlative relationships between them. The correlations between the changed values of the indicators were also calculated for correlation coefficients. The graphs, face the average values of the experimental period indicators at different doses of biotin used. The graphs reflect the tendency of the relationship between the indicators in the study. In the linear red graph indicate the correlation relationships between the indicators in the study, while in the linear blue graph the tendency of the correlation between the indicators is shown.

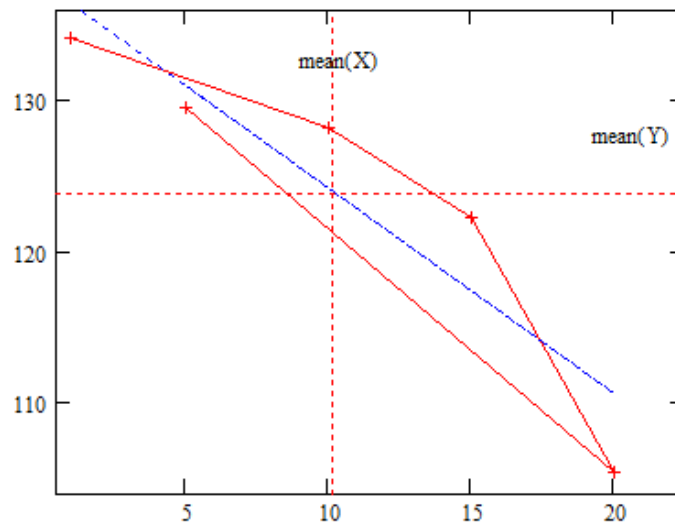


Fig 1. Relationship of Days Open indicators with biotinic usage ( $r = - 0.531$ ).

From the graph of fig. 1, it appears that the Days Open indicator in the cows is indicated by the dose of biotin use. The correlative relation between them is strong and negative ( $r = - 0.531$ ). Strong correlative relations and also of the negative character appear between the mid-

range index of copulation in cows with different biotin dosage supplementation, as shown in the graph of Fig. 2.

Evaluating the above conclusions, can be selected the fact of biotin influence as a food supplement on some reproductive indicators, as the results were obtained under experimental conditions with comparable groups of cows. In our opinion, the use of biotin affects the improvement of metabolic processes in general and Proteins metabolism and lipid metabolism in particular. Biotin improves the level of total proteins in serum, affects the level of total calcium and inorganic phosphorus, due to the increased activity of some enzymes in its presence, Abel, H.J., and bp. (2001), Baldwin, R.L. and bp. (1983). Biotin also influences rumen microphage activity which is responsible for the synthesis of propionic acid, Baldwin, R.L. and bp. (1983).

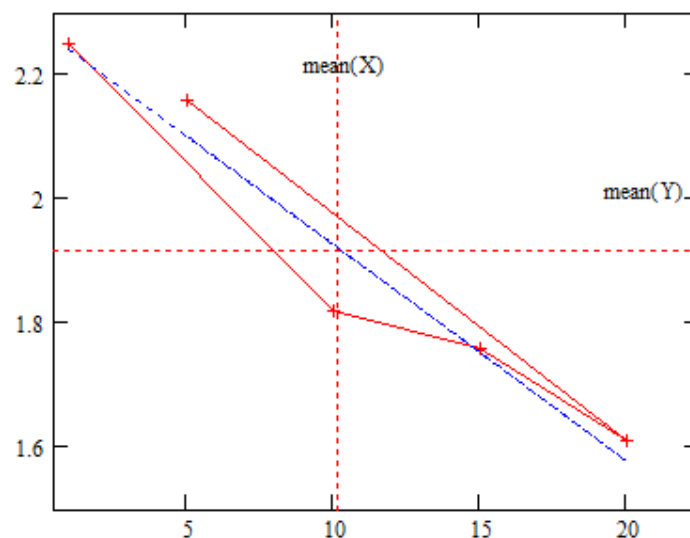


Fig 2. Relationship between the index of copulation n with biotin usage dose, ( $r = -0.603$ ).

The obtained data create the conviction that biotin plays an important role in improving cow reproduction indicators, but for these and other issues, studies will continue in the future.

#### 4. Conclusions

Biotin supplementation in the transition period in cows has positive effects on the various metabolic processes and the improvement of reproduction indicators.

Biotin treated cows have a higher glucose level in blood. The difference is up to  $3.4 \pm 3$  mg% and the differences are statistically verified ( $P < 0.05$ ).

From reproduction indicators, the Pre service period (PSP) seems unindicated from the use of biotin, while the Days open (DO) and the index of copuation (IC) are the most influenced indicators. In the cows groups treated with the biotin supplement, Days open (DO) was with

28.74 ± 0.42 days less and the index of copulation (IC) was with 0.64 ± 0.12 less strains for pregnant cows. Changes in the days open interval are statistically verified (P <0.05).

Between the reproduction indicators and biotin dosage use, are strong correlative relations of the negative character (ie r = - 0.531 for the days open (DO) and r = - 0.603 for the index of copulation (IC).

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