# THE RELATIONSHIP BETWEEN PRE-VACCINATION ANTIBODIES LEVEL AND LONGEVITY OF DAIRY COWS IN WEST SIBERIA

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## SUMMARY

The effect of dairy cattle improvement to the disease resistance will be conducive to increasing of the livestock longevity. The best approach to animal breeding for resistance according Karlikov (1986) is using the indices of the immune reactivity.

The titers of the pre-vacciation antibodies to Brucella abortus and Salmonella dublin antigenes of 213 Black-and-White cows from West Siberia were studied. 3 cattle's groups were revealed with low, middle and high responce against both antigenes. The longevity and the morbidity among these groups were studied. The significant differences of mean longevity have been detected between cows with low, middle and high pre-vaccination antibodies titers. The low response level's cows were characterized by the least longevity. The high-response level's cows were characterized by the largest longevity and minimal morbidity by some diseases.

Keywords: Black-and-White cattle, immune response, longevity.

## INTRODUCTION

One of the main problems of cattle breeding in Russia is the low length of animal life. The short-term employment of the animals causes the reduction of productivity indices, since cows do not use in the period of the heyday; with the short period of the employment also troubles the realization of the selection programmes.

One of the reasons of the short period of animal using is their susceptibility to different diseases. The precautionary measures of different kinds often do not give positive results (Mayer and Bruckmeier, 1987), therefore great value has resistance created by selection.

The direct determination of farm animals resistance and susceptible by means of pathogenic organisms infection is impossible in most cases. Therefore it is necessary to search the marker traits which will can estimate the animal resistance.

The indirect selection of farm animals for disease resistance can be realized by using some physiological indices of the organism. However, the selection to the disease resistance probably will be carried out by means of using traits of the immune reactivity (Stewart et al., 1984, 1985) which can be determined without experimental infection of animals.

The purpose of our report is evaluation of some traits of the immune reactivity of the healthy cows living in the typical Russian conditions.

It was necessary for the success of the selection for disease resistance to detect the relationships between immune reactivity and viability traits and the resistance to different diseases.

## MATERIALS AND METHODS

213 Black-and-White cows from two stud farms of West Siberia were studied. The pre-vaccination antibodies were determined by the reaction of agglutination with antigenes of Brucella abortus and Salmonella dublin. The antibodies titers were expressed throught modulus of lgx (dilution 1:10 corresponds as 1).

Cows which had the titers up to 0.8 were considered as low-responsive; ones with titers from 0.9 to 1.3 - as middle-responsive; with titer 1.4 and higher - as high-responsive.

## RESULTS AND DISCUSSION

Data have been obtained pointing out to big variability of pre-vaccination antibody titers. The coefficient of variation (Cv) for antibody titers to S.dublin was 32%, to B.abortus made up 44%.Average titer to S.dublin was $1.22 \pm 0.026$; to B.abortus was $1.04 \pm 0.032$.

There were no significant relationships between antibodies titers to the both antigenes and milk productivity indices.

The absence of correlations, including negative ones, between these traits will make it possible to carry out the selection for disease resistance without the reduction of the cows productivity.

Significant differences between groups differing in immune reactiity have been found in the average longevity (Table 1).

**Table 1. The longevity of cows (years) with different levels of immune response**

| Cows | Cows tested with S.dublin | | Cows tested with B.abortus | |
|---|---|---|---|---|
| groups | n | x±Sx | n | x±Sx |
| low responsive | 27 | 5.85±0.31 | 65 | 6.31±0.19 |
| middle responsive | 125 | 6.59±0.13 | 116 | 6.65±0.13 |
| high responsive | 61 | 6.83±0.15 | 32 | 7.40±0.22 |

The differences between groups with low and middle titers and between high and low titers to S.dublin were significant ($P<0.05$ and $P<0.01$ respectively).

Also there were differences in the longevity between cows differing by level of the antibodies to B.abortus. Significant differences were found between the low-responsive and high-responsive groups ($P<0.001$) and between high-responsive and middle responsive ones ($P<0.01$).

The difference in the morbidity by obstetrical and gyneacological diseases between middle responsive and high responsive to S.dublin groups was significant ($P<0.05$). The significant difference in the morbidity by leg diseases between high responsive and low responsive to B.abortus groups ($P<0.05$).

Cows from high-responsive group have been slaughtered by the more late term.

Since the pre-vaccionation antibodies titers to S.dublin and B.abortus can be considred as the traits characterizing the cows viability in Siberia.

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