

TRANSFERRIN AND Hb-TYPES IN IRAQI LOCAL SHARABI AND FRIESIAN CATTLE IN
IRAQ AND SOME PRODUCTION AND ADAPTATION TRAITS

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SUMMARY

This study was conducted to investigate the relation between Tf and Hb-type with some production and adaptive traits in Iraqi local Sharabi and imported Friesian cattle. Tf genes, A, D, and E are found in both breeds at a frequency of 0.464, 0.500 and 0.036 in Friesians and 0.363, 0.426 and 0.191 for the Sharabi.

All Friesians were fixed for gene Hb-A while the A and B genes were segregating at frequencies of 0.64 and 0.46 in the Sharabi.

INTRODUCTION

Several workers have studied the association between some genetic markers and production and reproduction traits in cattle (Ashton, 1958, 1959; Gahne et al., 1960; Gahne, 1961).

Tf and Hb types were mostly studied. Mode of inheritance was reported to be the same. Results of gene frequencies and association with some of the traits were contradicting and varied from breed to breed and from geographical region to another as expected.

The aim of this study is to report for the first time on gene frequencies among Iraqi and imported Friesians, and on their association with some production and adaptive traits in Iraq.

MATERIAL AND METHODS

The study included 262 imported Friesians and 73 Sharabi. The Friesians were raised around Baghdad central area where atmospheric temperature ranges between 4.0 and 43.5°C. The Sharabi were raised in the northern part of the country where the temperature ranges between 2.4 and 43.1°C for January and July respectively.

About 20 cc blood samples were taken from the jugular vein (during September, October and November) 1987. For Hb typing the samples were treated for electrophoretic purposes using Beckman, LKB according to Varley (1967) and Altaif (1975). Typing was done according to Evans et al. (1956). For Tf typing electrophoresis was also done on Beckman, LKB.

Identification of types was done following Ashton (1960). Statistical analyses were according to Snedecor and Cochran (1968) and the Harvey computer program (1987).

RESULTS

Transferrin types

Six types, namely AA, DD, EE, AD, AE and DE were identified. Their typing was confirmed by a scanner. Frequencies of genes A, D and E were 0.464, 0.500 and 0.036 respectively for the Friesians and 0.363, 0.426 and

0.191 for the Sharabi in the same order. In Friesians the Chi-square test of significance showed a non-significant departure from expected. The departure was significant in the Sharabi. The AE genotype was clearly at a disadvantage. The E gene frequency in the Sharabi was more than five fold higher in comparison with the Friesians. A and D gene frequencies were very close.

Haemoglobin types

All Friesians were fixed for gene A while the three genotypes AA, AB, and BB were identified for the Sharabi which showed an A gene frequency of 0.64. The Chi square test reflected no significant departure from expected genotype frequency.

Tf & Hb types and Production traits

Least square means of full record milk production were 2054±94 kg for the Friesians and 565±33 kg for the Sharabi. In the Friesian, Tf, AA and AD were about 190 kg above the mean while AE was 260 kg below the mean. In the Sharabi the DD mean was 93 kg above average, though the least squares analysis showed a non significant transferrin effect. The effect of Hb type on milk production was also not significant.

Transferrin type has only a significant effect on calving interval and dry period ($P < 0.05$) in the Friesians. LSD showed that Tf, DD and AE have the shortest interval (-41 days). Least square means were 464 days for calving interval and 145 days for the dry period.

Hb types and Tf and adaptation

Two traits were taken for this purpose, namely respiration and coefficient of heat tolerance.

Friesian cattle have a higher respiration rate than the Sharabi (34/min versus 31/min). On the contrary, heat tolerance was higher in the Sharabi (99 versus 96). Body temperature was the same. The differences among the least square means of these attributes according to Tf type were not significant.

The Hb type effect was significant for body temperature and heat tolerance in Sharabi. The BB type has significantly the highest body temperature while AB has the lowest. For heat tolerance AB has the highest followed by AA then BB. Differences were significant ($P < 0.05$).

DISCUSSION

There is no value in comparing our results with those obtained by other workers in different geographical regions and on different breeds as differences are usually expected; but it is of value to point to the fixation of Friesian cattle to gene Hb A, and to the segregation of A and B, in the Sharabi local cattle at nearly intermediate frequencies. Connected with that is the significant effect of Hb type on body temperature, from high to low, BB, AA and AB, and according to heat tolerance, AB, AA and BB.

The other point is the high frequency of Tf E in the Sharabi (0.19) compared to the Friesians (0.036). Tf E for most European breeds is always reported to be at a low frequency, (Ashton 1958, 1959; Ghane 1960;

Osterhof, 1964), and high in the tropical and semi tropical breeds.

Whether these points have something to do with adaptation is still not clear and needs further studies, taking into consideration that European breeds are intensely selected for high yield and adapted to cold climate.

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