

Brief Communication

CHOLINESTERASE IN PLASMA AND ACETYLCHOLINESTERASE IN ERYTHROCYTES FROM CATTLE OF DIFFERENT BREEDS AND AGES AND FED DIFFERENT DIETS

Elevated levels in plasmacholinesterase (pChE) in cows suffering from parturient paresis have been reported (*Forslund et al.* 1983). Also changes in erythrocyte acetylcholinesterase (eAChE) levels during different lactation stages have been described by *Forslund et al.* The different breeds of cattle Swedish Friesian Breed (SLB), Swedish Red and White Breed (SRB) and Swedish Jersey Breed (SJB) have shown different frequencies of parturient paresis: 3, 8 and 15—20 %, respectively (*Ekesbo* 1966). High energy diet and age are said to influence the frequency of parturient paresis (*Jönsson* 1960, *Gardner & Park* 1973). Thus it was of interest to study the levels of pChE and eAChE in cattle concerning effects of age, diet and breed.

Fifty cows of SJB, SRB and SLB were included in this study. The animals belonged to the University farm, Uppsala. Their ages varied between 2.5 and 7 years. Their lactation stage varied from newly delivered to the dry period. At the sampling time none of them suffered from any disease. Each breed group (16—17 animals in each) was divided into two sub-groups, one receiving a high energy diet the other a low energy diet. The animals were selected in such a way that all ages were represented in both groups. One blood sample was obtained from each animal through puncture of the jugular vein. To the tube was added 10 IU/ml of heparin. The treatment and handling of the blood samples were the same as described earlier by *Forslund et al.* (1983). The pChE levels and eAChE levels were determined by modification of the method described by *Ellman et al.* (1961). Student's t-test for unpaired data were used for statistical evaluation. The results are presented in Table 1.

Table 1. The effect of breed, age and diet on pChE and eAChE (in $\mu\text{kat/l}$).

	pChE				eAChE		
	n	\bar{x}	s	range	\bar{x}	s	range
SJB	17	2.16	0.52	1.46—3.13	133.1 ¹⁾	12.2	111.9—156.6
SRB	17	1.96	0.53	1.21—3.08	143.7 ²⁾	17.3	119.2—185.3
SLB	16	1.84	0.40	1.36—2.83	159.5 ³⁾	21.0	127.0—217.5
Born							
1975-77	27	2.02	0.51	1.46—3.13	145.7	23.1	111.9—217.5
Born							
1978-79	23	1.96	0.52	1.21—3.03	144.9	17.4	124.1—173.2
High energy diet	25	2.02	0.56	1.21—3.13	144.6	19.3	111.9—185.3
Low energy diet	25	1.97	0.46	1.41—3.08	145.7	21.9	121.8—217.5

1) Significantly different from 2) ($P < 0.05$) and 3) ($P < 0.001$)

2) " " " 3) ($P < 0.05$)

The eAChE level in SLB was significantly higher than the eAChE level in SRB ($P \leq 0.05$) and in SJB ($P \leq 0.001$). The differences in pChE between SLB, SRB and SJB were not significant.

Age and diet did not influence the pChE level nor the eAChE level in this study. Influence of age on the pChE levels in cattle has earlier been reported by *Forsslund et al.* (1983) but in those studies young animals (<6 months) were compared to adults. In this study with only one blood sample taken from each animal with different stage of lactation the lactation stage might cover an influence of age and breed on the pChE level. The influence of lactation stage on the pChE level and eAChE shows a decrease in pChE immediately after parturition but no significant changes in eAChE (*Forsslund et al.*).

The main purpose of this study was to find whether pChE was higher in the breed with the highest frequency of parturient paresis (SJB) compared to the other breeds (SLB and SRB). The level of pChE in SJB was not significantly higher than the levels in SRB and SLB. However, the significant differences in eAChE with the highest level in the SLB breed might be an indication of differences in the cholinergic system in the different breeds of cattle.

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