4 - 39

RELATIONSHIP BETWEEN THE LEVEL OF SOME BIOCHEMICAL AND HEMATOLOGICAL PARAMETERS IN DE BLOOD AND MEET PRODUCTION IN CATTLE AND SHEEP

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INTRODUCTION

Some investigators found that the higher level of the activity of the enzymes GOT and GPT in pig's blood plasma related with better possibility for muscle protein biosintesis (Smirnov and Karlikov , 1968). Smirnov (1974) and Rostovcev et al (1971) found higher level of the activity of above mentioned enzymes in the blood plasma of beef cattle breeds in comparison with dairy cattle breeds .
Higher activity of the enzyme GPT in the blood plasma of sheep for meat - Wool production in comparison with the sheep breed specialized on wool production was found by Smirnov (1974).
Smirnov (1974) found that the activity of the Alkaline phosphatase was higher with 14 % in the blood plasma of beef cattle breeds in comparison with dairy cattle breeds
Guszkiewicz et al. (1971) observed higher activity of plasmic Aldolase in the Charole breed than the Jersey breed. Leyko et al. (1974) found significantly higher of AMP , ATP, and Aldolase in the blood plasma of Black and White cattle than the Charole breed .
We have found also higher level of the activity of some enzymes (Creatinphosphokinase and Phosphoxeksose isomerase) in the blood plasma of cows belonging to Bulgarian brown cattle breed (dual purpose breed) than in the plasma of Black and White breed (Makaveev , 1980).
Lanina (1973) found higher level of albumin contents and GOT activity in the blood plasma of dual purpose cattle breeds in comparison with dairy cattle breeds.
Rowlands (1980) found good correlations between growth rates and glucose concentrations (r = + 0,44) and albumin concentrations (r = + 0,38) in the blood of beef calves at 6 months age.
Recently Banerji et al . (1984) found significant correlations between back fat and p.c.v. (r = + 0,52) , total protein (r = + 0,54) , LDH activity (r = + 0,63) and cholesterol (r = + 0,56) in the blood plasma of 77 male lambs from India .
Some authors published informations on the relationships between protein (enzyme) phenotypes of polymorphic loci and growth rate and meat production of fattening Young bulls and lambs (Heidler ,1973, Tjankov , 1972).
The aim of our study was to find some information concerning the relatioships between genetically determined protein and enzyme phenotypes in the blood of young bulls and lambs and their growth rates and meat production

MATERIAL AND METHODS

Object of this study were 41 fattening young bulls of Bulgarian brown cattle breed (Dual purpos) and 55 fattening male lambs of Cigaja breed . The enzymatic methods for determination the levels of the activities of the enzymes Acide phosphatase (Acp) , Glutamatoxaloacetate transaminase (GOT) , Glutamatpyruvate transaminase (GPT) , Phosphoxeksase isomerase (PHI) , Creatinphosphokinase (Cpk) , Alkaline phosphotase (Akp) , Amylase (Am) , Ceruloplasmin (Cp) 6- Phosphogluconate dehydrogenase (6 - PGD) and Adenosine triphosphate (ATP) in the blood of animal studied used in this work were described inother papers published (Makaveev , 1970, 1976 , 1977) .
Under the study were daily gain , dressing percentage , meat of carcass in % , bone of carcass in % , percen fat , final weght and feed units per kg gain .
Phenotype correlations and significance of differences between meat production traits in animals with different protein phenotypes were calculated .

RESULTS AND DISCUSSION

The calculated phenotype correlations between the level of enzyme activities in the blood and some slaughter's traits in fattening bulls are shown on table 1 . In this table We can see the positive significant phenotype

correlations between the daily gain and the level of the activity of the enzymes GOT , GPT , CPK , Akp and 6-PGD , and negative correlation with the activity of plasmic Acp enzyme .
Positive and significant phenotype correlations We calculated and between Dressing percentage and the activity of enzymes - Acp , GOT , GPT and CPK , and negative correlation with the activity of the enzyme PHI .
Meet of carcass in % correlated positive and significantly only with the level of the activity of enzyme Acp in blood plasma.
Bone of carcass in % correlated significantly only negative with the activity of GPT and 6-PGD enzymes .
Eye muscle area of m.long dorsi correlated significantly positive only with the level of the enzymes - GOT and GPT .
The variation of protein and enzyme phenotypes in the bull's blood show Us some positive tendency for relationships with some fattening capacity of the bulls studied (table 2) .
Significantly higher dressing percentage was found in the group of bulls with the transferrin type in their blood plasma - Tf AD (p / 0,01) in comparisson with the bulls with the transferrin types Tf AA and Tf DD.
Higher eay muscle area was found in the group of fattening bulls with transferin type Tf DD in comparisson with the bulls with type - Tf AD.
Higher dressing percentage have the bulls belonging to amylase genotype - Am BB (p ∠ 0,001) in comparisson with the bulls with the genotype Am BC . The bulls with genotype Am BC have significantly more meat in carcass than the bulls with genotype Am CC .
No significant differences were found between the bulls bellonging to other protein and enzyme genotypes .
The phenotype correlations between the level of the enzyme activities in the blood of fattening lambs of Cigaja breed and daily gain and some slaughter's traits are shown on table 3 .
On the table 3 We can see the positive significant correlations between daily gain and the activity of enzymes GOT and GPT .
The better utilization of food expressed as Feed units per kg gain correlated significantly with the level of the activity of the enzymes GOT and Am .

Dressing percentage correlated positive with the activity of Akp enzyme and negative with the Cp.
Significant correlation We can see between meat of carcass (%) and the activity of GPT.
Final weight of fattening lambs correlated positive with the activity of the enzymes GOT and GPT and negative with the activity of CPK .
The variation of daily gain and other slaughter's traits of the fattening male lambs in conection with the protein phenotypes of the polymorphic loci is given on the table 4.In this table are shown only these protein and enzyme polymorphic systems in which We observed significant differences between the daily gain and slaughter's traits of lambs with different protein genotypes in their blood .
Higher daily gain We have found of the lambs with genotypes Tf CD (0,284) p ∠ 0,001 and genotypes MDH AA (0,272) p ∠ 0,05 . Significantly higher dressing percentage have had the lambs with genotype Tf BD (48,97) p / 0,01. Significantly less % of bone in carcass have had the lambs with genotypes Tf BD (19,91 %), Tf AB (20,60) Tf DE (21,34) and Tf CD (21,47) in comparisson with the lambs with genotype Tf AA (24,14 %).
Significantly more meat in carcass in percents have had the lambs with genotypes Tf CD (69,35 %) and CA SS (68,28 %). Significantly more fat in percent of carcass have had the lambs with EsA^- phenotype (10,51 %) in comparisson with the lambs with phenotype EsA^+ (9,26 %) and with genotype CA FS (11,62) than the genotype CA SS (9,83 %). Significant less consum of feed units per kg daily gain We have found in the lambs with genotype Tf CD (5,33).
No significant differences of the daily gain and slaughter's traits of the fattening lambs differ by the hemoglobin type , alkaline phosphatase and diaphorase types in their blood were found .

Table 1

Phenotype correlations between some biochemical parameters in the blood and daily gain and some slaughter traits in fattening young bulls of Bulgarian brown breed

BIOCHEMICAL PARAMETERS	Phenotype correlations											
	Daily gain			Dressing percentage			Meat of carcass %			Bone of carcass %		
	n	rp	± Srp	n	rp	± Srp	n	rp	± Srp	n	rp	± Srp
Acp mU/ml	41	-0,425+	± 0,14	41	+0,380+	±0,15	35	-0,529+	± 0,15	35	+0,114	± 0,17
GOT mU/ml	41	+0,606+	± 0,13	41	+0,303+	±0,15	35	+0,046	± 0,17	35	-0,202	± 0,17
GPT mU/ml	41	+0,649+	± 0,12	41	+0,395+	±0,15	35	+0,197	± 0,17	35	-0,396+	± 0,16
PHI μM/ml/h	41	-0,178	± 0,16	41	-0,476+	±0,14	35	-0,210	± 0,17	35	+0,196	± 0,1[illegible]
CPK mU/ml	41	+0,476+	± 0,14	41	+0,301	±0,15	35	+0,232	± 0,17	35	+0,232	± 0,17
Akp mU/ml	41	+0,435+	± 0,14	41	-0,279	±0,15	35	+0,306	± 0,17	35	-0,174	± 0,17
Am U/100ml	41	+0,260	± 0,15	41	+0,093	±0,16	35	-0,046	± 0,17	35	-0,028	± 0,17
Cp mg %	41	+0,195	± 0,16	41	-0,050	±0,16	35	-0,054	± 0,17	35	-0,054	± 0,17
6-PGDIU/gHb	41	+0,472+	± 0,14	41	+0,058	±0,16	35	+0,049	± 0,17	35	-0,690+	± 0,13
ATP mol/l	41	+0,124	± 0,16	41	-0,207	±0,16	35	-0,261	± 0,16	35	+0,233	± 0,17

+ = Significant (p ∠ 0,05)

Table 2

Daily gain and Meat quality of fattening bulls of Bulgarian brawn cattle breed with different protein genotypes in their blood .

PROTEIN GENOTYPES	Daily gain g			Dressing percentage			Meat in carcass %			Bone in carcass %			Eay muscle area cm^2		
	n	$\bar{x}$	± $S\bar{x}$	n	$\bar{x}$	± $S\bar{x}$	n	$\bar{x}$	± $S\bar{x}$	n	$\bar{x}$	± $S\bar{x}$	n	$\bar{x}$	± $S\bar{x}$
Tf AA	2	1000	± 98,30	2	57,89	± 0,32	2	81,30	±0,00	2	22,05	± 0,07	2	91,55	± 5,98
Tf DD	10	1060	± 30,51	10	58,70	± 0,71	8	82,15	±0,58	8	20,41	± 0,85	9	93,89+++	± 1,54
Tf AD	26	1084	± 17,76	26	59,50++	± 0,36	23	81,26	±0,40	23	21,12	± 0,44	23	88,45	± 4,36
Am BB	19	1092	± 23,18	19	60,14+++	± 0,42	18	81,26	±0,53	18	21,00	± 0,57	19	90,12	± 1,26
Am CC	4	1106	± 24,40	4	59,46	± 1,07	3	80,97	±0,33	3	21,71	± 0,82	4	93,45	± 2,43
Am BC	17	1045	± 22,43	17	58,27	± 0,43	13	81,99+	±0,34	13	20,79	±0,53	12	90,61	± 2,10
Hb AA	38	1068	± 15,45	38	59,11	± 0,96	33	81,47	±1,59	33	21,05	±0,38	34	90,33	± 3,01
Hb AB	3	1165	± 23,99	3	57,60	± 0,09	2	82,36	±0,69	2	20,11	±0,95	2	90,16	± 0,02
Cp AA	31	1067	± 18,78	31	59,14	± 1,42	26	81,39	±0,30	26	21,30	±0,41	26	90,52	± 3,83
Cp AC	6	1057	± 7,91	6	58,48	± 0,47	5	81,39	±0,40	5	21,65	±0,71	6	89,77	± 2,70

+++ = p ∠0,001 ; ++ = p ∠ 0,01 ; + = p ∠ 0,05 .

Table 3

Phenotype correlations between the level of enzyme activities in the blood and daily gain and some slaughter's traits in fattening lambs of Cigaja breed .

Enzymes	n	Daily gain g rp	± Srp	Feed units per/kg gain rp	± Srp	Dressing percen. rp	± Srp	Meat of carcass% rp	± Srp	Bone of carcass % rp	± Srp	Percent fat % rp	± Srp	Final weight kg rp	± Srp
AKP	55	+0,090	0,14	+0,25	0,13	+0,64 +++	0,10	-0,08	0,14	-0,02	0,14	+0,11	0,14	+0,21	0,14
GOT	55	+0,750 +++	0,09	-0,43 ++	0,12	-0,15	0,14	+0,07	0,14	+0,02	0,14	-0,11	0,14	+0,44 +++	0,12
GPT	55	+0,590 +++	0,11	-0,16	0,13	+0,14	0,14	+0,30 +	0,13	+0,00	0,00	0,00	0,00	+0,60 +++	0,11
Am	55	+0,100	0,14	+0,30 +	0,13	-0,20	0,13	-0,03	0,14	-0,16	0,13	+0,26	0,12	-0,13	0,14
CPK	55	-0,220	0,14	+0,18	0,13	+0,13	0,14	0,00	0,00	+0,04	0,14	-0,03	0,14	-0,32 +	0,13
Cp	55	+0,180	0,13	-0,18	0,13	-0,33 +	0,13	+0,15	0,14	+0,13	0,14	-0,23	0,13	-0,10	0,14
SDH	55	0,000	0,00	+0,02	0,14	+0,03	0,14	-0,04	0,14	-0,06	0,14	-0,05	0,14	+0,09	0,14
PHI	55	-0,040	0,14	+0,26	0,13	+0,07	0,14	-0,13	0,14	+0,07	0,14	+0,06	0,14	-0,03	0,14

$+ = p < 0,05$; $++ = p < 0,01$; $+++ = p < 0,001$

Table 4

Daily gain and slanghter's traits of fattening male lambs of the cigaja Sheep breed with different protein genotypes in their blood

Protein genotypes	n	Daily gain $\bar{x}$	Dressing percentage $\bar{x}$	Bone in carcass % $\bar{x}$	Meat in carcass % $\bar{x}$	Fat % $\bar{x}$	Feed units per kg gain $\bar{x}$
Tf AD	12	0,239	44,60	22,33	67,69	9,87	6,31
Tf DD	18	0,263	45,23	21,79	68,46	9,80	5,64
Tf BD	3	0,207	48,97 ++	19,91 +++	68,09	12,00	7,77 +++
Tf CD	9	0,284 +++	45,48	21,47 +++	69,35 +	9,19	5,33
Tf DE	4	0,245	47,56	21,34 ++	67,18	11,48	6,13
Tf AB	2	0,223	48,13	20,60 +++	68,74	10,67	7,36
Tf AA	2	0,265	44,57	24,14	67,84	8,02	5,94
EsA+	24	0,253	45,36	22,13	68,65	9,26	5,77
EsA-	29	0,257	45,85	21,56	67,89	10,51 +	6,16
CA SS	46	0,255	45,66	21,91	68,28 ++	9,83	5,97
CA FS	5	0,241	46,06	21,84	66,30	11,62 +++	6,02
MDHAA	8	0,273 +	45,45	22,50	68,17	9,44	5,67
MDHAB	33	0,250	46,07	21,56	68,51	9,93	5,95
MDHBB	11	0,254	44,98	22,26	67,38	10,36	6,25

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