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## **Pathogenesis, Gepatogenetic interaction and early diagnosis of lipid metabolism disorders in productive cows in Uzbekistan conditions**

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### **Abstract**

In the article are shown the results of blood tests on lipid metabolism in cows, depending on age, time of lactation and pregnancy, as well as the ecological factors, pathogenesis, gepathogenic consequences and early diagnosis of its disorders.

**Keywords:** cow; lipid metabolism; the age of the cow; lactation and pregnancy; insecurity of the diet; lipids; gepathogenic consequences; protein; glucose; enzymes; immune status; degeneration of the liver; early diagnosis.

### **1. Introduction**

Analysis of the results of research conducted by many foreign and domestic scientists show that one of the main features of metabolic disorders in animals are hidden for a relatively long period of time and the mass coverage of livestock, making them difficult to timely diagnose and treatment [3]. This reduces body weight and milk production of cows born young unsustainable increases feed consumption per unit of output, deteriorating reproductive ability of breeding stock, resulting in large economic losses [6, 9].

According to I.G. Sharabrin and co-author (1983), the main reason for violation of protein metabolism in cows is defective and one-sided feeding, especially low content of digestible protein diet (90-120 g per f.u.).

This pathology noted in animals are not only due to the lack, excess or low quality forage proteins [1, 5] or essential amino acids (arginine, histidine, isoleucine, leucine, lysine, methionine, cystine, phenylalanine, tyrosine, threonine, triprophan) [12], but also with diarrhea, edema, hemorrhagic diathesis, proteinuria, ascites, fasting, fever, poisoning, radioactive irradiation, a number of infectious and parasitic diseases [13].

In case of violation of carbohydrate metabolism reveal a lack of early digestible carbohydrate feed, the prevalence in the diet of acetic and butyric acids [8].

On lipid metabolism in the body significantly affect vitamins A, D, E, F and Biologically active substances such as phospholipids and sterols (2).

They recommend to evaluate the metabolism of protein in the number of common protein and protein fractions in blood serum, as well as the results of protein - sediment samples [7]. Carbohydrates – sugar content and ratio of sugar in the diet and the protein amount in the blood glucose [1, 13]. Lipids – at blood concentrations of triglyceride, non-esterified fatty acids, phospholipids, beta-lipoproteins, total cholesterol and esterified [2, 7, 9].

Data on the impact of early diagnosis and lipid metabolism gepathogenic other character in cows in Uzbekistan is missing.

The purpose is to determine spreading, etiological factors, gepathogenic consequences, develop a method of early diagnosis of disorders of lipid metabolism in productive cows.

### **2. Material and Methods**

The experiments were conducted in assotation farms “Dustlik” Pastdargom district Samarkand province.

For the experiment were selected 10 heifers and 10 cows the 1st-5 th calving with an average daily milk production up to 10 kg. In heifers of different stages of pregnancy and in lactating cows were bled monthly for biochemical analysis, and if necessary – underwent clinical examination and examined the liver.

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To examine the state of lipid in the blood exchange determined amount of triglycerides (a method of Sardes and Manning), non-esterified fatty acids (method of electrophoresis and Tibling), phospholipids (method of Barlet-Usher), beta-lipoprotein (Burststein method Vinogradova modification), total (method Liberman-Burchard in Ilka modification) and esterified (Balakhovskiy method) cholesterol. And the study geopathogenic consequences of a breach in the blood and its serum was determined by the number of red blood cells (Goryaeva method), hemoglobin (Sali method), common protein (refractometric method), protein fractions (turbidimetric, nephelometric), urea (color reaction with diacilmonookcim), bilirubin (method Iendrashek, Kleggorn and Grof), and the activity of enzymes AST and ALT (dinitrofenilhidrazina method Reitman, Frenkel), SDG (resorcinol method Sewell and Tovarek), LDG (2,4-dinitrofenilgidrazinec method Sewell and Tovarek), GGT (witch LY-glutamine – 4-nitroanilide), and CE (colorimetric method).

Specifies the number of T-(rosette method using sheep red blood cells-E-ROC) – and B-(formation of tue third complement component receptor formation method) - lymphocytes in the blood.

When the liver study drew attention to the yellowness of the mucous membranes, body pain and topographical boundaries, we analyzed the content in the diets of essential nutrients, vitamins and minerals components.

**3. The results of research**

The results of research aimed at understanding the state of lipid metabolism in cows and heifers are shown in Table.1.

The table shows that the cows and heifers lipid level varies with age. Thus, the amount of total lipids (heifers from 362,0±22,94 mg%, the fifth calving in cows 422,4±20,55 mg%) and non-esterified fatty acids (heifers 6,0±0,12 mg%, in the fifth calving 13,6±0,91 mg%) increases by age. Thus –the amount of total cholesterol in heifers (2, 4±0, 10 mmol/l), the first

**Table 1:** Lipid metabolism dynamics in cows and heifer

Indicators	Lactation and pregnancy period, months									
	1	2	3	4	5	6	7	8	8	9
<b>Heifers</b>										
Total lipids, mg%	362±22,94	362,9±22,72	364,6±23,08	368,8±23,52	372,5±23,81	377,0±24,53	386,5±26,34	390,4±27,13		390,6±48,2
Triglycerides, mg%	82,5±0,35	84,0±0,36	84,1±0,36	86,6±0,90	88,4±0,79	90,6±0,79	92,5±0,75	96,2±1,30		97,6±1,74
Phospholipids, mg%	220,2±3,65	236,6±6,4	241,5±7,02	245,5±7,78	256,0±4,31	260,4±5,35	275,5±5,99	282,2±40,8		284,5±8,22
Beta-lipoprotein, mg%	285,8±4,62	287,5±5,35	290,0±7,49	292,2±7,92	296,3±4,55	299,1±4,85	301,6±3,60	306,5±3,94		310,2±5,50
NEFA, mg/%	6,0±0,12	6,5±0,18	7,2±0,18	9,8±0,87	9,9±0,88	10,6±0,94	10,8±0,91	11,2±0,42		11,5±0,86
Total cholest., Mmol/l	2,4±0,10	2,4±0,11	2,4±0,11	2,4±0,07	2,4±0,11	2,2±0,11	2,2±0,12	2,1±0,13		2,1±0,13
Chol. esters, Mmol/l	1,0±0,05	1,0±0,07	1,1±0,07	1,1±0,08	1,1±0,04	1,2±0,04	1,22±0,04	1,24±0,04		1,24±0,03
<b>Cows of 1 calves</b>										
Total lipids, mg%	391,0±27,13	396,6±28,15	401,4±29,02	405,7±29,9	408,2±30,25	408,5±30,32	412,0±30,68	415,6±31,55	421,4±31,04	425,5±30,53
Triglycerides, mg%	90,5±1,08	90,4±1,06	76,5±0,99	78,5±1,27	80,8±1,77	82,6±1,45	83,3±1,3	84,5±1,05	86,2±0,65	97,6±1,85
Phospholipids, mg%	286,5±3,90	250,6±6,0	221,1±4,50	226,5±5,72	231,7±5,79	236,0±6,69	245,5±1,84	252,2±3,51	257,2±5,45	261,5±6,22
Beta-lipoprotein, mg%	315,4±4,60	325,5±4,59	328,5±4,44	331,0±4,67	333,3±4,52	335,6±4,67	338,8±4,20	340,5±4,36	342,5±4,56	350,2±5,01
NEFA, mg/%	9,8±0,42	14,6±1,18	16,3±0,64	15,8±0,69	14,1±0,94	13,0±1,01	11,5±1,19	10,8±0,52	10,6±0,69	10,5±0,63
Total cholest., Mmol/l	2,4±0,10	2,4±0,11	2,4±0,10	2,4±0,07	2,4±0,07	2,4±0,07	2,4±0,07	2,4±0,11	2,3±0,11	2,2±0,11
Chol. esters, Mmol/l	1,22±0,05	1,22±0,05	1,22±0,04	1,30±0,04	1,32±0,05	1,32±0,05	1,34±0,04	1,36±0,05	1,36±0,04	1,40±0,04
<b>Cows of 2 calves</b>										
Total lipids, mg%	406,4±26,12	431,4±22,14	432,2±22,21	446,0±24,17	448,8±25,11	449,0±24,96	449,2±24,96	412,4±30,90	404,6±30,68	402,5±30,75
Triglycerides, mg%	94,1±0,78	86,0±0,87	78,8±1,27	75,2±0,62	76,6±0,55	78,8±1,27	80,5±1,16	82,0±1,45	84,2±0,72	86,4±0,95
Phospholipids, mg%	281,4±5,63	236,6±8,03	209,1±5,17	204,6±4,26	208,5±4,45	214,4±5,25	220,0±6,08	225,5±7,6	241,5±4,7	252,2±6,23
Beta-lipoprotein, mg%	332,2±6,60	331,3±6,55	331,1±6,5	320,0±6,34	322,5±5,51	328,8±6,08	333,8±6,62	337,7±7,05	342,0±6,87	347,5±5,22
NEFA, mg/%	10,2±0,71	16,5±1,23	17,6±1,23	18,4±0,65	16,2±0,62	14,5±0,83	12,0±1,19	11,9±1,19	11,7±1,19	11,6±0,51
Total cholest., Mmol/l	2,3±0,10	2,5±0,14	2,6±0,18	3,0±0,11	3,0±0,11	3,1±0,11	2,6±0,10	2,6±0,14	2,4±0,11	2,4±0,12
Chol. esters, Mmol/l	1,48±0,06	1,40±0,06	1,20±0,06	1,18±0,05	1,18±0,04	1,20±0,04	1,24±0,04	1,24±0,04	1,24±0,04	1,24±0,05
<b>Cows of 3 calves</b>										
Total lipids, mg%	406,6±26,12	407,2±25,80	416,2±24,82	424,2±24,10	425,2±23,70	431,4±23,20	424,6±23,81	413,3±24,31	412,1±24,30	411,2±24,64
Triglycerides, mg%	92,7±0,38	85,5±0,58	78,5±1,0	69,9±0,88	69,0±0,79	69,5±0,75	75,2±0,21	78,9±0,36	80,2±0,71	84,5±1,77
Phospholipids, mg%	272,5±3,60	220,6±4,22	176,6±4,59	165,5±6,10	142,5±4,34	146,4±3,99	176,0±5,02	204,4±3,85	218,5±3,72	241,4±7,21
Beta-lipoprotein, mg%	331,7±3,62	330,8±3,51	322,5±2,97	321,2±2,42	312,6±3,54	324,5±3,56	327,6±3,51	331,5±3,30	336,0±5,52	342,5±5,43
NEFA, mg/%	11,7±0,14	12,6±0,20	14,5±0,21	17,4±0,92	20,5±0,84	16,6±0,72	10,5±0,59	9,0±0,21	8,8±0,20	8,6±0,83
Total cholest., Mmol/l	2,33±0,10	2,46±0,10	2,61±0,09	3,12±0,04	3,25±0,12	3,32±0,12	3,24±0,18	3,12±0,17	3,01±0,15	2,82±0,14

Chol. esters, Mmol/l	1,46±0,05	1,43±0,04	1,30±0,02	1,20±0,02	1,14±0,04	1,16±0,04	1,18±0,02	1,20±0,02	1,20±0,02	1,23±0,04
<b>Cows of 4 calves</b>										
Total lipids, mg%	411,5±24,6	414,1±25,04	430,3±20,84	445,7±24,20	425,5±20,7	421,2±21,56	416,0±20,98	414,4±20,69	416,0±20,4	418,5±20,76
Triglycerides, mg%	88,2±0,72	86,5±0,59	85,4±1,34	84,2±1,74	82,7±1,48	79,0±0,91	79,0±0,91	82,4±0,83	83,1±1,34	83,9±1,49
Phospholipids, mg%	242,9±7,42	235,5±6,51	220,2±5,14	218,5±4,78	206,6±1,06	178,5±5,33	192,6±7,67	204,4±7,41	212,0±6,87	220,0±7,65
Beta-lipoprotein, mg%	330,3±9,22	327,6±9,26	324,5±5,43	323,1±9,08	321,4±8,57	320,2±8,58	324,8±8,32	327,5±7,60	328,8±5,72	329,4±5,85
NEFA, mg/%	12,1±0,74	12,2±0,69	13,0±0,62	13,8±0,65	14,4±0,58	14,6±0,66	11,1±0,62	10,8±0,62	9,5±0,47	8,9±0,36
Total cholest., Mmol/l	3,0±0,11	3,0±0,11	3,11±0,12	3,20±0,13	3,50±0,13	3,6±0,12	3,4±0,11	3,4±0,11	3,2±0,11	3,2±0,10
Chol. esters, Mmol/l	1,34±0,05	1,30±0,05	1,25±0,05	1,22±0,06	1,20±0,04	1,16±0,04	1,18±0,05	1,19±0,04	1,19±0,05	1,20±0,05
<b>Cows of 5 calves</b>										
Total lipids, mg%	422,4±20,55	446,6±22,86	460,2±23,73	452,5±22,79	451,0±22,43	445,1±21,99	441,0±21,35	451,2±23,37	454,4±23,73	466,6±24,67
Triglycerides, mg%	86,6±0,77	85,5±1,19	84,4±1,88	83,1±1,63	82,6±1,48	82,0±1,30	79,8±1,03	81,5±0,78	82,8±1,66	83,2±1,70
Phospholipids, mg%	234,5±5,60	229,2±4,56	224,5±10,42	220,8±10,06	206,4±8,83	188,5±6,69	176,0±4,33	181,9±4,49	185,1±5,68	192,6±6,12
Beta-lipoprotein, mg%	328,5±6,26	327,0±5,25	324,8±5,25	323,2±5,34	321,5±5,39	320,2±5,25	318,4±5,77	321,8±4,85	323,4±5,21	324,5±5,02
NEFA, mg/%	13,6±0,91	13,9±0,9	14,1±0,87	14,3±0,87	14,5±0,83	14,7±0,83	15,4±0,85	11,3±0,67	10,8±0,68	9,2±0,64
Total cholest., Mmol/l	3,4±0,10	3,42±0,10	3,60±0,08	3,65±0,09	3,65±0,08	3,80±0,11	3,95±0,11	3,99±0,12	4,0±0,10	4,03±0,12
Chol. esters, Mmol/l	1,30±0,05	1,28±0,05	1,20±0,04	1,19±0,04	1,18±0,05	1,16±0,05	1,14±0,07	1,12±0,06	1,14±0,06	1,15±0,07

calving cow (2,4±0,10 mmol/l), second (2,3±0,10 mmol/l) and third (2,33±0,10 mmol/l) was almost calving equal level, the fourth calving cow (3,0±0,11 mmol/l) and fifth (3,4±0,10 mmol/l) amount of calving this figure was 30 - 45 % higher than that of animals of other ages.

The amount of phospholipids to the first calving (from 220,2 ± 3,65 to 286,5 ± 3,90 mg%), triglycerides (from 82,5±0,35 to 94,1±0,78 mg%), beta-lipoprotein (from 285,8±4,62 to 332,2±6,60 mg%) and cholesterol ester (from 1,0±0,05 to 1,48±0,06 mmol/l) – up to the second calving cows was increased and then to the fifth calving (up to 234,5±5,60 mg%, 86,6±0,77 mg%, 328,5±6,26 mg% and 1,30±0,05 mmol/l, respectively) underwent a slight decrease, which indicates the most intense lipid metabolism in cows third, fourth and fifth calving than in cows and heifers of first and second calving. Depending on the time of pregnancy and lactation, lipid levels exhibits a peculiar dynamics. So, the amount of total lipids heifers (from 362 ± 22,94 to 390,6 ± 48,2 mg%), triglycerides (from 82,5 ± 0,35 to 97,6 ± 1,74 mg%), NEFA (with 6,0 ± 0,12 to 11,5 ± 0,86 mg%), phospholipids (from 220,2 ± 3,65 до 284,5 ± 8,22 mg%), beta-lipoprotein (from 285,8 ± 4,62 to 310,2 ± 5,50 mg%) and cholesterol ester (from 1,0 ± 0,05 to 1,24 ± 0,03 mmol/l) starting from the first month of pregnancy until the end of it dynamically increases, the number of total cholesterol (from 2,4 ± 0,10 to 2,1 ± 0,13 mmol/l) during that period, on the contrary, happens reducing. At first calving cow total lipids amount (from 391,0±27,13 to 425,5±30,53 mg%), beta-lipoprotein (from 315,4±4,60 to 350,2±5,01 mg%) and cholesterol ester (from 1,22±0,05 to 1,40±0,04 mmol/l) starting at the beginning of lactation until the end of the dry period is increased, the amount of total cholesterol (from 2,4±0,10 to 2,2±0,11 mmol/l) during this period, on the contrary, decreases.

The amount of triglycerides (from 90,5±1,08 up to 76,5±0,99 mg%) and phospholipids (with up to 286,5±3,90 to 221,1±4,50 mg%) since the start of lactation up to his third month decreases, and then, before the end of the dry period (up to 97,6±1,85 mg% and to 261,5±6,22 mg%, respectively) increases, the number of NEFA, on the

contrary, since the start of lactation up to her third month increased (from 9,8±0,42 to 16,3±0,64 mg%), and then to the end of the dry period is dynamically reduced ( up to 10,5±0,63 mg%).

Cows calving a second amount of total lipids (from 406,4±26,12 to 449,2±24,96 mg%), until the seventh, NEFA (from 10,2±0,71 to 17,6±123 mg%) – up to third, total cholesterol (from 2,3±0,10 to 3,1±0,11 mmol/l) –up to sixth month of lactation is increased, until the end of the dry period (up to 402,5±30,75 mg% to 11,6±0,51 mg% and to 2,4±0,12 mmol/l, respectively) decreases. Triglycerides (from 94,1±0,78 to 75,2±0,62 mg%), phospholipids (from 281,4±5,63 to 204,6±4,26 mg%) and beta-lipoprotein (with 332,2±6,60 to 320,0±6,34 mg%) tiu the end of the fourth month and the amount of cholesterol esters (from 1,48±0,06 mmol/l to 1,18±0,04 mmol/l) – to the fifth month lactation is reduced and then, until the end of the dry period (up to 86,4±0,95 mg%, to 252,2±6,23 mg%, to 347,5±5,22 mg% and to 1,24±0,05 mmol/l, respectively) increases.

At calving cows of third number total lipids (from 406,6±26,12 to 431,4±23,20 mg%) and total cholesterol (from 2,33±0,10 to 3,32±0,12 mmol/l until the third month, NEFA (from 11,7±0,14 to 20,5±0,84 mg%) – up to the fifth month of lactation dynamically increased, and then to the end of the dry period (up to 411,2±24,64 mg%, to 2,82±0,14 mmol/l and to 8,6±0,83 mg%, respectively) decreases. The number of triglycerides (from 92,7±0,38 to 69,0±0,79 mg%), phospholipids (from 272,5±3,60 to 142,5±4,34 mg%), beta-lipoprotein (from 331,7±3,62 to 312,6±3,54 mg%) and cholesterol esters (from 1,46±0,05 to 1,14±0,04 mmol/l) to the fifth month of lactation is reduced dynamically and then till the end of the dry period (up to 84,5±1,77 mg%, to 241,4±7,21 mg%, to 342,5±5,43 mg% and to 1,23±0,04 mmol/l, respectively) increased.

Cows calving a fourth quantity of total lipids (from 411,5±24,6 to 445,7±24,20 mg%) to the fourth month, the number of NEFA (from 12,1±0,74 to 14,6±0,66 mg%) and total cholesterol (from 3,0±0,11 to 3,6±0,12 mmol/l) until the sixth month of lactation dynamically increases, and then, until the end of the dry period (up to 418,5±20,76 mg%, to

8,9±036 mg% and to 3,2±010 mmol/l) increases. Of amount triglycerides (from 88,2±0,72 to 79,0±0,91 mg%), phospholipids (from 242,9±7,42 to 178,5±5,33 mg%), beta-lipoprotein (from 330,3±9,22 to 320,2±8,58 mg%) and cholesterol esters (from 1,34±0,05 to 1,16±0,04 mmol/l) to the sixth lactation month dynamically reduced, and then, until the end of the dry period (up to 83,9±1,49 mg%, to 220,0±7,65 mg%, to 329,4±5,85 mg% and 1,20±0,05 mmol/l, respectively) increases.

The fifth cows calving the amount of total lipids (from 422,4±20,55 to 460,2±23,73 mg%) to the third month, the number of NEFA (from 13,6±0,91 to 15,4±0,85 mg%) - up to seventh, total cholesterol (from 3,4±0,10 to 4,03±0,12 mmol/l) - up to the end of the dry period is increased dynamically. Triglycerides (from 86,6±0,77 to 79,8±1,03 mg%), phospholipids (from 234,5±5,60 to 176,0±4,33 mg%) and beta-lipoprotein (from 328,5±6,26 to 318,4±5,77 mg%) - up to the seventh month, cholesterol esters (from 1,30±0,05 to 1,12±0,06 mmol/l) - to the eighth month lactation dynamically reduced, and then, until the end of the dry period (up to 83,2±1,70 mg%, to 192,6±6,12 mg%, to 324,5±5,02 mg% and to 1,15±0,07 mmol/l, respectively) increases.

From mentioned above implies that the level of protein, carbohydrate and lipid metabolism in cows varies depending upon age, pregnancy and lactation period and geo-ecological conditions and such changes in average make 60-100% of the animals have in the form of low, at 10-50% of the animals have in the form of greatly reduced levels of protein, carbohydrate and lipid metabolism.

Its necessary to note that lipid lowering, in most cases accompanied by decrease of erythrocyte count (to 5,24 ±0,41 mln/mkl), hemoglobin (up to 84,0±0,49 g/l), common protein (up to 52,5±0,22 g/l), albumin (up to 26,0±0,50%), glucose (to 1,59±0,02 mmol/l) and urea (up to 1,8±0,04 mmol/l).

By lowering the level of lipid metabolism was observed a marked increase in ALT (up to 0,45±0,01 mmol/h.l), AST (up to 0,92±0,03 mmol/h.l), of LDG (up to 5,01±0,41 mmol/h.ml), SDG (up to 2,0±0,17 mmol/h.ml), GGT (up to 128,4±4,35 mkmol /ML) and a decrease in CE (up to 51,4±1,88 mkmol / h.ml).

When the pulse frequency was observed (up to 62, 2 - 63,7 times per min) and respiration ( to 23,6- 24,9 times per min). Hypo- and atony proventriculus swept up to 30-40, lizuha-30-40, yellowness mucous membranes, increased border liver and her tenderness swept up to 20-30 percent of the animals.

It is characterized by increasing the immune status of a number of blood B-lymphocytes (for 30, 32%) and a decrease in T- lymphocytes (to 15, 1%). Including a decrease in the number of T-helper cells (51, 6 %) and T-suppressor (for 23, 5 %), the increase T-killer cells (15, 8%).

Due to the fact that in case of violation of lipid metabolism, along with other prominent pathological changes in the exchange substances set the changes that indicate pathology liver, we are in terms of local slaughterhouses and meat stalls area, which contained the experimental cows was conducted organoleptic testing samples liver results which shows that the most prevalent pathologies in the liver tissue of cows is a degeneration that under the Samarkand province (adequate conditional) averages 31,5-38,0, Kashkadarya province (extreme condition)-33,3-44,0, Bukhara province (sharply extreme condition) -36,0-48,0 %.

It was observed the decrease in the average daily weight gain of cattle by 19, 4%, milk yield - 60 %, increase in infertility and the degree of liver tissue rejection - by 33, 3% and lowering the weight of calves at birth - by 8%, the annual economic al damage by I head of cows in adequate conditions on average was 1723350, in extreme and sharply extreme conditions 1810416 and 1902800 soums, respectively. Zoo technical feed analysis results and their comparison with normative data [4] shows that in the winter-spring diet of dairy cows on the general nutritionalall insecurity is 7,5%, in digestible protein, 6,0%, phosphorus - by 20,0 %, for sugar -by 53,2%, according carotene -60%, and increased security for calcium (30%), sugar-protein ratio in it 0,42 (at a rate 0,8), calcium-phosphorus - 2,32 (at a rate of 1,5-2,0), that in our opinion, is the main cause of disturbances of lipid metabolism in cows, especially during lactation enhanced. An analysis of the literature data and the results of our clinical and laboratory experiment have shown that lipid metabolism in productive cows [3] cover definitely large number of animals in the group and developed in close relationship with the disorders of protein and carbohydrate metabolism, and for a long period (months and years) can occur hidden, clinically manifested only in the form of so-called general metabolic syndrome, that is characterized by emaciation, a decrease in milk production and milk quality, deterioration of reproductive capacity and lengthening the service period, in the incidence of detention afterbirth, endometritis, maternity paresis and birth underdeveloped calves, often become ill neonatal dyspepsia, bronchopneumonia, rickets, etc. Such cows and calves are often subjected to forced slaughter.

In the absence of effective prevention and treatment of the animals with increasing age of the cow, especially at the peak of lactation because of energy supply shortages and plastic material first, on one hand developes violation formation of volatile fatty acids in the proventriculus towards reducing the amount of propionic, increasing oil - acids that should by energy imbalance (violation of cycle tricorbone acids), on the other hand- a violation of microbial processes and ribosomal protein synthesis, hence the amino acid metabolism. The necessity appears in gluconeogenesis, where in energy metabolism include lipids, which cleavage products are glycerol and fatty acids. Oxidized fatty acids accumulate in the cytoplasm of hepatocytes in the form of fat globules (fatty) that brings to dystrophy.

Violated liver functions, i.e. general metabolic syndrome goes into stage dysfunctions liver as dystrophy (hepatogenic consequences), which is clinically accompanied by lizuha, hypotonia and atony proventriculus, increased heart rate and respiration, yellowness of the mucous membranes, pain reaction to palpation of the liver and increases its borders. In decrease blood erythrocyte amount, hemoglobin, common protein, albumin, urea, glucose, triglycerides, phospholipids and beta-lipoprotein, cholesterol esters, increase - bilirubin, total cholesterol, NEFA. Also, increased activity of ALT, AST, SDH, LDH, GGT, reduced- CE. It lowers the immune status of the organism.

Sensory evaluation of liver tissue samples found that the most prevalent pathologies in the liver of cows is a degeneration, an average of 31, 5-48, 0% depending on the geo-ecological conditions.

Its necessary to note that the inclusion in the energy metabolism of tissue proteins, except for degenerative lesions liver, increases the probability of development of

cirrhotic changes in the body, hence the hepatogenic reverse reaction, which is accompanied by an even more profound impairment of protein-carbohydrate and lipid metabolism of required nature. According to this, in the fight against metabolic disorders, including disorders with liver leading role is devoted for early diagnosis.

#### 4. Conclusion

1. Violation of lipid metabolism in productive cows can certainly cover a large number of animals in the group and developed in close relationship with the disorders of protein and carbohydrate metabolism, and for a long period (months, years) can take place secretly, clinically manifested only in a so-called general metabolic syndrome.
2. In the absence of effective prevention and treatment of the animals with increasing age of the cows, especially during the height of lactation general metabolic syndrome goes into stage dysfunctions liver as dystrophy (gepathogenic consequences), which is accompanied by special gepatho clinical and gepathobiochemical changes and as determined by the state of the immune status.
3. The main etiological factors violations of protein and carbohydrate and lipid metabolism and liver dystrophy in cows are deficit diet of sugar, phosphorus and carotene in the excessive content of calcium, a low ratio of sugar and protein, and a high ratio of calcium and phosphorus. This form of metabolic disorders is more shown in adult cows than young. Its emergence contribute to hay- concentrate type of feeding and soil salinity.
4. For the early diagnosis of disorders of protein-carbohydrate-lipid metabolism and liver dystrophy in cows it is advisable to arrange the planned check-up, which, takes into account age, time of lactation, nutritional diet, the degree of soil salinity and general metabolic syndrome (emaciation, decrease in milk yield and milk quality, deterioration of the reproductive capacity and lengthening the service period, the increase in the incidence of detention afterbirth, endometritis, maternity paresis, as well as the birth of weak developed calves) to conduct clinical research aimed at identifying the specific gepathoclinical (lizuha, hypo-and atony proventriculus, increased heart rate and respiration, yellow mucous membranes, pain response to palpation the liver and increase its boundaries) and special gepathobiochemical (decrease erythrocyte count, hemoglobin, common protein, albumin, urea, glucose, triglycerides, phospholipids, beta-lipoprotein and cholesterol esters, increase – bilirubin, NEFA and total cholesterol, as well as an increase of activity of Alt, Ast, Sdh, Ldh, Ggt and decrease-in the blood - ChE) changes.

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