International Journal of Multidisciplinary Research and Development 2014; 1(2): 6-10

International Journal of Multidisciplinary Research and Development

IJMRD 2014; 1(2): 6-10
www.allsubjectjournal.com
Received: 30-06-2014
Accepted: 11-7-2014
e-ISSN: 2349-4182
p-ISSN: 2349-5979

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Bioecological situation in Kyrgyzstan and its solutions

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Abstract
The influence of anthropogenic pollution on biogeocenotic of pathology in animals, as well as a comprehensive analysis on the biogeochemical food chain: - soil - water - food - animals on the content of heavy metals and separated macro-and micronutrients.

Keywords: Man-made, environment, biogeocenotical pathology, soil, water, air, food, blood, cow, calves, macro-and micronutrients, heavy metals.

1. Introduction

The influence of anthropogenic pollution on biogeocenotic on the food chain, soil-water-animals on the heavy metals and separated macro and micro-nutrients.

Currently studying environmental issues in mountain areas, especially Kyrgyzstan attaches great importance. This is due, firstly, to the fact that the mountainous areas in our country make up 94.2% of the total area, which is home to almost half of the total population. Of these, 36% and at altitudes of 1,000 to 2,000 m and 5% of the population with at altitudes above 2000 m. Secondly, as an indicator of the mountains of global climate change, always serve as an ideal object of study of certain ecosystems.

Climate in Kyrgyzstan generally harsh continental or continental, is determined by its geographical position. Here is a great location on the role of climatic zones. They are divided into the following four zones: piedmont, middle, and high-nival. Piedmont zone is from 500 to 1200 m, the average July temperature of 20-250 ^{0}C, in January-4 ...-70C. Midland zone from 900 to 2200 m above sea level, the average temperature in July is 18 190S, January 7 ...-80C. Alpine zone from 2000 to 3500 m, the average temperature in July is 11 160C, January 8, ...-100 C. Winters are long (November-March). Nival zone (3,500 m and above) is characterized by severe, very cold climates. At the bottom of the average July temperature of 4-70C-10 ... January-220 C. Absolute minimum in winter is -30 ...-400C (Ak-Sai, Arpa), and the absolute maximum in summer is +30 ... +440 C (Fergana Valley).

Rainfall distribution in the territory, is also very uneven. Some regions receive large amounts of moisture up to 1500 mm per year (Naryn, Chatkal, Kemin, Toktogul valley), considerably less rainfall observed in Talas, Issyk-Kul and Chui valleys (250 to 500 mm) in some areas of Osh and Jalal-Abad them ranges from 300 to 700 mm is the least well-off moisture western part of Issyk-Kulya (Balykchi, 110mm) and some regions in the south of the republic (Batken 156 mm).

Other mining and climatic features of the republic - is a large influx of solar radiation. A significant drop in solar radiation depends primarily on the high mountain location Kyrgyzstan and lots of sunny days. Astronomical duration of the longest day in the republic average of 15 hours, and the shortest - 9:00. The average annual sunshine duration in the Naryn region to 296, Issyk-Kul valley up to 2000 hours, and Chui Oblast and the Southern regions of the country reach 2500 hours. In this regard, the territory of Kyrgyzstan receives a large amount of radiant energy from the sun. The magnitude of the total radiation, which is produced by a person for the year ranges 120-161, 4 kkl / kV.

It should be noted that more than 65 percent of the population lives in rural areas, of which 32.4 percent are engaged in agriculture. Farmland Republic is 10.7 million hectares of arable land, 1, 28 million hectares (12%), pasture and other lands-9, 4 million hectares (88%), of which 5.6 million hectares located in mountainous areas, and 2 million hectares in the valleys. From these data it can be assumed that in addressing the socio-economic development of Kyrgyzstan is very important livestock development.

Livestock is one of the leading industries in the country, its share in the gross output of agriculture is 47.5%. In this context, sustainable development of livestock production and Stabilization of the number of farm animals in the agricultural sector of the country, regarded as the main priorities. Dynamics of livestock production (Table 1) shows that from 1990 to 2000. Rates of meat production decreased by 23.3% or 104.9 thousand tonnes of milk by 7% or 79.8 thousand tons, eggs by 70.0% or 506.2 million units and wool reduced by 70 0% or 27,307 tons. Since 2008, the planned stabilization and growth of livestock production, so in 2010 compared to 2008, meat production increased by 11.2 thousand tons, or 3.3%, milk by 86.4 thousand tons, or 6, 8%, and wool production decreased by 48 tons, or 0.5%. In 2010 milk production totaled 1359.9 thousand tons, which is higher than the 1990 level 114.7% (1185.0 thousand tons). To level to 1990 meat produced below 23.9%, eggs by 47.8% and wool almost 3 times.

Table 1: Dynamics of livestock production in the Kyrgyz Republic from 1990-2010

Production	U. rev.	1990	2000	2005	2008	2009	2010
Meat, live weight	thousand tons	451,1	346,2	355,5	331,9	336,9	343,1
Milk	thousand tons	1185,0	1105,2	1173,0	1273,5	1314,7	1359,9
Eggs	million pcs	713,8	207,6	243,1	369,3	369,3	372,9
Wool	tons	39003	11696	11595	10904	11006	10856

One of the main factors that increase the growth of livestock production are the increase of the number of farm animals in the country (See Table 2). Since 2005. Observed stabilization and growth of farm animals other than pigs. In 2010 compared with 2005, the number of cattle increased by 20.8%, sheep and goats by 29.9%, 9.6% horses and poultry by 11%.

Table 2: Changes in the number of animals in the Kyrgyz Republic from 1990-2010

View animals	U. rev.	1990	2000	2005	2008	2009	2010
Cattle including cows	Thousand goal.	1205,2	947,0	1074,6	1224,5	1278,0	1298,8
	Thousand goal	506,1	523,8	565,2	635,6	664,3	666,4
Sheep and goats including ewes	Thousand goal.	9972,5	3799,2	3875,8	4502,6	4815,5	5037,7
	Thousand goal	5940,2	2405,1	2680,3	3132,8	3396,5	3426,7
Pigs	Thousand goal.	393,4	101,1	77,3	63,3	61,3	59,8
Horses	Thousand goal.	312,6	353,9	345,1	362,4	372,9	378,4
Bird	Thousand goal.	13914	3063,7	4279	4364,3	4535,7	4749,8

Table 3: The dynamics of productivity of livestock and poultry in the Kyrgyz Republic for 1990-2010

Index	U. rev.	1990	2000	2005	2008	2009	2010
The average yield of cow 1	kg	3070	2137	2140	2069	2041	2037
Average woolyield 1 goal.	kg	3,3	3,4	3,4	3,1	2,9	2,6
Average egg laying hens laying hens 1	pcs.	219	114	123	124	121	116

The data in Table 3 show that in 2000 the productivity of livestock and poultry far more reduced. This in our view, is primarily due to not conduct systematic monitoring to optimize ecosystems in Kyrgyzstan.

Such destruction of ecosystems in the country has led to widespread, previously unknown disease in plants, animals and humans, so named biogeocenotic pathology. This mass disease in plants, animals and humans that result from changes in neblogopoluchnyh Biogeocenosis (D.N.Urazaev, V.M.Truhachev *et al*, 2002).

Biogeocenotic study pathology in animals has been engaged by many scientists in the world and in our country (NA Urazaev 1985 V.A.Baturin *et al*, 1998; Elenshleger AA, 1998, 2005; AS Kashin, 2000; I.A.Shukuratova, 2001; Nogoybayev MD *et al*, 2002-2012; E. Shilov, *et al*, 2005;. E. R. Ismagilova, 2006; AA Schunk, 2008 and others).

To date, more than three dozen known biogeocenotic pathologies in animals, among them the attention of scientists and practitioners are attracted by such diseases that result from exposure to anthropogenic (human). Conducted more than ten years of research, we found that biogeocenotic disease in animals are caused by negative biogeocenotic situations prevailing in ecological systems. The main one is in violation of individual biogeocenosis its functional structure. For example, grant removal of macro-and micronutrients, wide unilateral use of fertilizers or chemical (radioactive) pollution.

In such cases, change biogeocenotic food chain: soil-plants - animals and animal develops biogeocenotic pathology.
In this regard, we have carried out in different areas of the Chui region in the period 2000 to 2012, Scientific research on the prediction of individual biogeocenotic pathologies in animals.

To this end, we conducted a comprehensive monitoring of biogeochemical food chain: - soil-water-plant-animal on the content of macro-and micronutrients and heavy metals. The results of the content of macro-and micronutrients in soil, water and feed are shown in Chui oblast table 4.

Table 4: Performance content of macro-and micronutrients in soil, water and feed Chui oblast

No. p/p	Name elements	Content of macro-and micronutrients					
		Soil mg/kg	Norma mg/kg	Water mg / l	Norma mg / l	Feed mg/kg	Norma mg / kg
1.	**calcium**	9056,0	3000,0	35,6	70,0	6,6	5,0
2.	**phosphorus**	785,0	150,0	0,01	0,05	1,5	3,5
3.	**cobalt**	1,26	1,3	0,004	0,01	0,2	0,5
4.	**manganese**	46,5	70,0	0,001	0,02	38,9	55,0
5.	**zinc**	1,05	0,5	0,0007	0,005	26,5	30,0
6.	**copper**	0,68	6,8	0,005	0,05	7,1	8,5
7.	**iron**	17,5	170,0	0,007	0,3	165,0	200
8.	**magnesium**	763,0	700,0	5,74	15,0	989,1	600
9.	**selenium**	0,001	0,002	0,02	0,03	0,04	0,1
10.	**iodine**	0,002	2,0	0,01	0,04	0,1	0,5

Note: Identified the average content of macro-and micronutrients in soil, water and feed

The average content of macro-and microelements in soil Chui area compared with the data required rate somewhat lower amount such as moving standards cobalt, manganese, copper, iron, selenium, iodine, and certain elements, such as calcium, phosphorus, zinc, magnesium exceeds the rate conversely.
The same bias sets on macro-and microelements in the water (see Table 4) that the amount of nutrients in the test samples is significantly lower or higher than normal. For example, calcium, cobalt, manganese, iron, magnesium, selenium, iodine, almost twice as low. This suggests that the geochemical properties of fresh water are not the same and does not depend only on the type of landscape, but also on other factors, the chemistry of the parent rocks. Therefore, in different zones biogeocoenose fresh water may vary in content of various macro-minerals.
One of the important environmental components of the normal physiological functioning of the body is full of animal feed. Content of macro-and micronutrients in the body of animals, mainly depends on the receipt of macro-and micronutrients to food.

Since the elements in the process of absorption and exchange exist a close relationship, deficiency or excess of one affects the other and the assimilation of the whole of the animal organism.
From Table 4, it can be concluded that all feed this poor biogeocoenose phosphorus, cobalt, manganese, zinc, copper, iron, selenium and iodine and is slightly above the average rate of calcium and magnesium. These data confirm once again that in this region created biogeochemical area where deficiencies recorded macro-and micronutrients, and an excess of the individual as calcium and magnesium. As a result, there are often biogeocenotic Animal Pathology, namely rickets and malnutrition in calves, ketosis and osteodystrophy in cow mothers with very widespread in this biogeocoenose (Chui oblast).
Adverse effects on the animals, some heavy (toxic) metals, especially lead, mercury, cadmium, chromium, arsenic, nickel, in this biogeocoenose unknown. In this regard, we have carried out studies above mentioned metals in soil, water, plants GPP "Sokuluk" Chui (see Table5).

Table 5: Data content of heavy metals in soil and water ILI "Sokuluk" Chui oblast

No. p/p	chemical element	The content of heavy metals			
		soil mg / kg	rate mg / kg	water mg / kg	rate mg / kg
1.	**lead**	12,0	10,0	0,02	0,03
2.	**mercury**	1,0	0,004	0,01	0,0005
3.	**cadmium**	0,25	0,5	0,002	0,001
4.	**chrome**	31,0	50,0	0,008	0,05
5.	**arsenic**	7,0	10,0	0,04	0,5
6.	**nickel**	22,0	25,0	0,005	0,1

Note: - Identified the average content of heavy metals in soil and water

Based on these studies, it can be assumed that the average content of selected heavy metals in soil, water and plants, such as lead, mercury, compared with the required rate is slightly higher than, and others as chromium, arsenic, nickel and vice versa is much lower than normal contents.

Table 6: These studies morfobiohimicheskih blood of cows and newborn calves

No. p\p	index	Корова		rate	calves		rate
		ketosis	osteodystrophy		rickets	Wasting	
1.	Erythrocytes, 10 / l	5,04±0,04	4,7 ±0,38	7,5 ±0,01	5,3±0,18	6,3±0,1	8,0±0,01
2.	Hemoglobin, g / l	9,64±0,30	12,7 ±0,34	12,9±0,05	91,3±0,41	103,2±2,2	109,0±0,03
3.	Leukocytes, 10 / l	7,21±1,07	7,21 ±1,07	12,5±0,01	6,1±0,82	7,2±0,3	12,0±0,01
4.	Total protein, g%	4,6±0,18	3,9 ±0,29	8,6±0,03	4,1±0,19	4,01±1,9	6,0±0,04
5.	Reserve alkalinity, vol% CO2	32,3±2,26	37,0 ±4,31	66,0±0,45	44,1±0,37	20,2±0,72	56,0±0,33
6.	Calcium, mg%	12,3±0,27	11,8 ±0,77	12,5±0,41	12,0±0,12	8,52±0,35	12,8±0,13
7.	Phosphorus, mg%	3,08±0,12	2,9 ±0,05	6,0±0,22	4,6±0,18	5,20±0,93	6,9±0,23
8.	Sugar, mg%	32,4±1,42	38,2 ±1,48	60,0±0,31	39,8±1,2	47,6±0,44	98,2±0,45
9.	Ketone bodies, mg%	15,2±1,30	3,8 ±1,8	6,0±0,04	4,07±0,14	-	3,2±2,11

From the data in Table 6, it can be assumed that all indicators morfobiohimicheskie cows and newborn calves below the experimental group compared to the norm. Red blood cells in patients with ketosis cows below normal, 33.2% and 25.3% of hemoglobin, leukocytes by 42.3%, total protein 46.5%, reserve alkalinity by 51%, phosphorus 48.7 %, sugar by 46% and the amount of ketone bodies increased to 15.2 mg% vs 6.0 mg%. Content of erythrocytes in cows with osteodystrophy below the norm of 37.3%, 1.5% hemoglobin, white blood cells by 42.3%, also reduced total protein 54.6%, the reserve alkalinity of 43.9%, calcium deficiency is 5.6%. Identified a significant deficiency of phosphorus 51.7%, content of sugar was lower compared to the control group is 36.6%, the amount of ketone bodies ranged norm - 3,8 ± 1,8 mg%.

It should be noted that newborn calves suffering from rickets found morfobiohimicheskie significant changes in the blood, so a lack of red blood cells was - 33.7% -16.2% of hemoglobin, leukocyte-49, 1%, total protein decreased by 30.5%, Reserve alkalinity of 21.1%, 33.3% phosphorus and sugar content compared to the norm was lower by 4.5%, while the number of ketone bodies and calcium were within the physiological range.

And calves gipotrofikov amount of sugar is reduced to 47, 6 ± 0, 44 mg% when normotrofico this index variation is inside the 80, 0 ± 0, 02 mg%, a difference of-32, 4 mg% ($P \leq 0, 01$).

The same changes occur in the mineral metabolism of calves gipotrofikov, ie inorganic phosphorus was significantly reduced to 5,20 ± 0,93 mg% vs. 6, 4 ± 1, 09 mg% in normotrofico ($P \leq 0,05$), and total calcium content is reduced to the level of -8,52 ± 0,35 mg % and the accuracy of this indicator compared to normotrofico equate to $P \leq 0,01$.

Based on these experimental studies we can conclude that the breach cycle macro-and microelements on the Food Chain: - soil - water - plants - animals in separate Biogeocenosis arise biogeocenotic pathology in animals. In this regard, must be timely performed BIOECOLOGICAL monitoring.

To this end, we propose appropriate open a permanent Research and Training Centre for Veterinary ecology in the country. Research and Training Centre for Veterinary Ecology aims to timely conduct environmental monitoring in the country in order to optimize the development of ecosystems and environmentally sound treatment and preventive measures.

2. Conclusion

Summarizing the data obtained, the following conclusion can be made that a violation of the circulation of substances in certain biogeocoenose becomes the main cause of biogeocenotic pathologies in animals. In this regard, must be timely to conduct environmental monitoring to detect biogeocenotic pathology in animals and the development of environmentally sound treatment and preventive measures.

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