

ISSN 2224-526X

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ  
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ

# Х А Б А Р Л А Р Ы

---

---

## ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК  
РЕСПУБЛИКИ КАЗАХСТАН

## NEWS

OF THE NATIONAL ACADEMY OF SCIENCES  
OF THE REPUBLIC OF KAZAKHSTAN

АГРАРЛЫҚ ҒЫЛЫМДАР СЕРИЯСЫ



СЕРИЯ АГРАРНЫХ НАУК



SERIES OF AGRICULTURAL SCIENCES

1 (43)

ҚАҢТАР – АҚПАН 2018 ж.  
ЯНВАРЬ – ФЕВРАЛЬ 2018 г.  
JANUARY – FEBRUARY 2018

2011 ЖЫЛДЫҢ ҚАҢТАР АЙЫНАН ШЫҒА БАСТАҒАН  
ИЗДАЕТСЯ С ЯНВАРЯ 2011 ГОДА  
PUBLISHED SINCE JANUARY 2011

ЖЫЛЫНА 6 РЕТ ШЫҒАДЫ  
ВЫХОДИТ 6 РАЗ В ГОД  
PUBLISHED 6 TIMES A YEAR

АЛМАТЫ, ҚР ҰҒА  
АЛМАТЫ, НАН РК  
ALMATY, NAS RK

Б а с р е д а к т о р

**Есполов Т.И.,**

э.ғ.д, профессор,

ҚР ҰҒА академигі және вице-президенті

Р е д а к ц и я а л қ а с ы:

**Байзақов С.Б.**, э.ғ.д, проф., ҚР ҰҒА академигі (бас редактордың орынбасары); **Тиреуов К.М.**, э.ғ.д, проф., ҚР ҰҒА академигі (бас редактордың орынбасары); **Елешев Р.Е.**, т.ғ.д., проф., ҚР ҰҒА академигі; **Рау А.Г.**, т.ғ.д., проф., ҚР ҰҒА академигі; **Иванов Н.П.**, в.ғ.д, проф., ҚР ҰҒА академигі; **Кешуов С.А.**, т.ғ.д., проф., ҚР ҰҒА академигі; **Мелдебеков А.**, а.ш.ғ.д., проф., ҚР ҰҒА академигі; **Чоманов У.Ч.**, т.ғ.д., проф., ҚР ҰҒА академигі; **Елюбаев С.З.**, а.ш.ғ.д., проф., ҚР ҰҒА академигі; **Садыкулов Т.**, а.ш.ғ.д., проф., академигі; **Баймұқанов Д.А.**, а.ш.ғ.д., проф., ҚР ҰҒА корр-мүшесі; **Сансызбай А.Р.**, а.ш.ғ.д., проф., ҚР ҰҒА корр-мүшесі; **Умбетаев И.**, а.ш.ғ.д., проф., ҚР ҰҒА академигі; **Оспанов С.Р.**, а.ш.ғ.д., проф., ҚР ҰҒА құрметті мүшесі; **Олейченко С.И.**, а.ш.ғ.д., проф.; **Кененбаев С.Б.**, а.ш.ғ.д., проф., ҚР ҰҒА корр-мүшесі; **Омбаев А.М.**, а.ш.ғ.д., проф. ҚР ҰҒА корр-мүшесі; **Молдашев А.Б.**, э.ғ.д., проф., ҚР ҰҒА құрметті мүшесі; **Сагитов А.О.**, б.ғ.д., ҚР ҰҒА академигі; **Сапаров А.С.**, а.ш.ғ.д., проф., ҚР АШҒА академигі; **Балгабаев Н.Н.**, а.ш.ғ.д., проф.; **Умирзаков С.И.**, т.ғ.д, проф.; **Султанов А.А.**, в.ғ.д., проф., ҚР АШҒА академигі; **Алимкулов Ж.С.**, т.ғ.д., проф., ҚР АШҒА академигі; **Сарсембаева Н.Б.**, в.ғ.д., проф.

Р е д а к ц и я к е ñ е с і:

**Fasler-Kan Elizaveta**, Dr., University of asel Switzeland; **Koolmees Petrus Adrianus**, Prof. Dr., Utrecht University, The Netherlands; **Babadoost-Kondri Mohammad**, Prof., University of Illinois, USA; **Yus Aniza Binti Yusof**, Dr., University Putra, Malaysia; **Hesseln Hayley Fawn**, As. Prof., University of Saskatchewan, Canada; **Alex Morgounov**, Pr., International Maize and Wheat Improvement Center Turkey; **Андреш С.**, Молдова Республикасы ҰҒА академигі; **Гаврилюк Н.Н.**, Украина ҰҒА академигі; **Герасимович Л.С.**, Беларусь Республикасының ҰҒА академигі; **Мамедов Г.**, Азербайжан Республикасының ҰҒА академигі; **Шейко И.П.**, Беларусь Республикасының ҰҒА академигі; **Жалнин Э.В.**, т.ғ.д., проф., Ресей; **Боинчан Б.**, а.ш.ғ.д, проф., Молдова Республикасы; **Юлдашбаев Ю.А.**, а.ш.ғ.д, проф., РФА корр-мүшесі, Ресей.

Главный редактор

**Есполов Т.И.,**

доктор эконом. наук, проф.,  
вице-президент и академик НАН РК

Редакционная коллегия:

**Байзаков С.Б.**, доктор эконом. наук, проф., академик НАН РК (заместитель главного редактора); **Тиреуов К.М.**, доктор эконом. наук, проф., академик НАН РК (заместитель главного редактора); **Елешев Р.Е.**, доктор техн. наук, проф., академик НАН РК; **Рау А.Г.**, доктор техн. наук, проф., академик НАН РК; **Иванов Н.П.**, доктор ветеринар. наук, проф., академик НАН РК; **Кешуов С.А.**, доктор техн. наук, проф., академик НАН РК; **Мелдебеков А.**, доктор сельхоз. наук, проф., академик НАН РК; **Чоманов У.Ч.**, доктор техн. наук, проф., академик НАН РК; **Елюбаев С.З.**, доктор сельхоз. наук, проф., академик НАН РК; **Садыкулов Т.**, доктор сельхоз. наук, проф., академик НАН РК; **Баймуқанов Д.А.**, доктор сельхоз. наук, проф., член-корр. НАН РК; **Сансызбай А.Р.**, доктор сельхоз. наук, проф., член-корр. НАН РК; **Умбетаев И.**, доктор сельхоз. наук, проф., академик НАН РК; **Оспанов С.Р.**, доктор сельхоз. наук, проф., Почетный член НАН РК; **Олейченко С.И.**, доктор сельхоз. наук, проф.; **Кененбаев С.Б.**, доктор сельхоз. наук, проф., член-корр. НАН РК; **Омбаев А.М.**, доктор сельхоз. наук, проф член-корр. НАН РК.; **Молдашев А.Б.**, доктор эконом. наук, проф., Почетный член НАН РК; **Сагитов А.О.**, доктор биол. наук, академик НАН РК; **Сапаров А.С.**, доктор сельхоз. наук, проф., академик АСХН РК; **Балгабаев Н.Н.**, доктор сельхоз. наук, проф.; **Умирзаков С.И.**, доктор техн. наук, проф.; **Султанов А.А.**, доктор ветеринар. наук, проф., академик АСХН РК; **Алимкулов Ж.С.**, доктор техн. наук, проф., академик АСХН РК; **Сарсембаева Н.Б.**, доктор ветеринар. наук, проф.

Редакционный совет:

**Fasler-Kan Elizaveta**, Dr., University of asel Switzeland; **Koolmees Petrus Adrianus**, Prof. Dr., Utrecht University, The Netherlands; **Babadoost-Kondri Mohammad**, Prof., University of Illinois, USA; **Yus Aniza Binti Yusof**, Dr., University Putra, Malaysia; **Hesseln Hayley Fawn**, As.Prof., University of Saskatchewan, Canada; **Alex Morgounov**, Pr., International Maize and Wheat Improvement Center Turkey; **Андреш С.**, академик НАН Республики Молдова; **Гаврилюк Н.Н.**, академик НАН Украины; **Герасимович Л.С.**, академик НАН Республики Беларусь; **Мамедов Г.**, академик НАН Республики Азербайджан; **Шейко И.П.**, академик НАН Республики Беларусь; **Жалнин Э.В.**, доктор техн. наук, проф., Россия; **Боинчан Б.**, доктор сельхоз. наук, проф., Республика Молдова; **Юлдашбаев Ю.А.**, доктор сельхоз. наук, проф., член-корр. РАН, Россия.

**Известия Национальной академии наук Республики Казахстан. Серия аграрных наук.**

**ISSN 2224-526X**

Собственник: ООО «Национальная академия наук Республики Казахстан» (г. Алматы)

Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов Министерства культуры и информации Республики Казахстан № 10895-Ж, выданное 30.04.2010 г.

Периодичность 6 раз в год

Тираж: 300 экземпляров

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28, ком. 219-220, тел. 272-13-19, 272-13-18

<http://nauka-nanrk.kz/agricultural.kz>

---

© Национальная академия наук Республики Казахстан, 2018

Адрес типографии: ИП «Аруна», г. Алматы, ул. Муратбаева, 75

Chief Editor

**Espolov T.I.,**

Dr. economy. Sciences, prof.,  
Vice President and academician of the NAS RK

Editorial Board:

**Baizakov S.B.**, Dr. of economy sciences, prof., academician of NAS RK (deputy editor); **Tireuov K.M.**, Doctor of Economy Sciences., prof., academician of NAS RK (deputy editor); **Eleshev R.E.**, Dr. Of agricultural sciences, prof., academician of NAS RK; **Rau A.G.**, Dr. sciences, prof., academician of NAS RK; **Ivanov N.P.**, Dr. of veterinary sciences, prof., academician of NAS RK; **Keshuov S.A.**, Dr. sciences, prof., academician of NAS RK; **Meldebekov A.**, doctor of agricultural sciences, prof., academician of NAS RK; **Chomanov U.Ch.**, Dr. sciences, prof., academician of NAS RK; **Yelyubayev S.Z.**, Dr. of agricultural sciences, prof., academician of NAS RK; **Sadykulov T.**, Dr. Farm. Sciences, prof., academician of NAS RK; **Baimukanov D.A.**, doctor of agricultural sciences, prof., corresponding member NAS RK; **Sansyzbai A.R.**, doctor of agricultural sciences, prof., corresponding member NAS RK; **Umbetaev I.**, Dr. Farm. Sciences, prof., academician of NAS RK; **Ospanov S.R.**, Dr. agricultural sciences, prof., Honorary Member of NAS RK; **Oleychenko S.N.**, Dr. Of agricultural sciences, prof.; **Kenenbayev S.B.**, Dr. Agricultural sciences, prof., corresponding member NAS RK; **Ombayev A.M.**, Dr. Agricultural sciences, Prof. corresponding member NAS RK; **Moldashev A.B.**, Doctor of Economy sciences, prof., Honorary Member of NAS RK; **Sagitov A.O.**, Dr. biol. sciences, academician of NAS RK; **Saparov A.S.**, Doctor of agricultural sciences, prof., academician of NAS RK; **Balgabaev N.N.**, the doctor agricultural sciences, Prof.; **Umirzakov S.I.**, Dr. Sci. Sciences, Prof.; **Sultanov A.A.**, Dr. of veterinary sciences, prof., academician of the Academy of Agricultural Sciences of Kazakhstan; **Alimkulov J.C.**, Dr. of tekhncial sciences, prof., academician of the Academy of Agricultural sciences of Kazakhstan; **Sarsembayeva N.B.**, Dr. veterinary sciences, prof.

Editorial Board:

**Fasler-Kan Elizaveta**, Dr., University of Basel Switzzeland; **Koolmees Petrus Adrianus**, Prof. Dr., Utrecht University, The Netherlands; **Babadoost-Kondri Mohammad**, Prof., University of Illinois, USA; **Yus Aniza Binti Yusof**, Dr., University Putra, Malaysia; **Hesseln Hayley Fawn**, As. Prof., University of Saskatchewan, Canada; **Alex Morgounov**, candidate of agricultural sciences, International Maize and Wheat Improvement Center Turkey; **Andresh S.**, academician of NAS of Moldova; **Gavriluk N.N.**, academician of NAS of Ukraine; **Gerasimovich L.S.**, academician of NAS of Belorassia; **Mamadov G.**, academician of NAS of Azerbaijan; **Sheiko I.P.**, academician of NAS of Belorassia; **Zhalnin E.V.**, Dr. of technical sciences, professor, Russia, **Boinchan B.**, doctor of agricultural sciences, prof., Moldova; **Yuldashbayev Y.A.**, doctor of agricultural sciences, prof., corresponding member of RAS, Russia.

**News of the National Academy of Sciences of the Republic of Kazakhstan. Series of Agrarian Sciences.**

**ISSN 2224-526X**

Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)

The certificate of registration of a periodic printed publication in the Committee of Information and Archives of the Ministry of Culture and Information of the Republic of Kazakhstan N 10895-Ж, issued 30.04.2010

Periodicity: 6 times a year

Circulation: 300 copies

Editorial address: 28, Shevchenko str., of.219-220, Almaty, 050010, tel. 272-13-19, 272-13-18,  
<http://nauka-nanrk.kz/> [agricultural.kz](http://agricultural.kz)

---

© National Academy of Sciences of the Republic of Kazakhstan, 2018

Address of printing house: ST "Aruna", 75, Muratbayev str, Almaty

**NEWS**

OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN

**SERIES OF AGRICULTURAL SCIENCES**

ISSN 2224-526X

Volume 1, Number 43 (2018), 42 – 44

UDC 616.1/9:636.2(574. 51)

**A. A. Jangabulova<sup>1</sup>, A. Z. Maulanov<sup>2</sup>, A. A. Zhumageldiev<sup>1</sup>**

<sup>1</sup>Biological Safety Department, Kazakh national agrarian university, Almaty, Kazakhstan,

<sup>2</sup>Veterinary Sanitary Expertise and Hygiene Department, Kazakh national agrarian university, Almaty, Kazakhstan.

E-mail: ermaz@inbox.ru, ainur\_89\_jan@mail.ru

**HISTOLOGY OF MEAT PRODUCTS  
FROM CATTLE WITH KETOSIS**

**Abstract.** At present, all livestock dairy farms throughout the world suffer from ketosis. Ketosis mostly affects highly-productive animals. Ketosis causes severe clinical manifestations and sometimes mortality. The productivity of dairy cows with ketosis decreases to the minimum and recovered animals lose their previous productivity.

**Key words:** ketosis, histology, dystrophia, haemotoxylin eosin, hepatocyte, pathoanatomy.

**Introduction.** Prevalence of ketosis of dairy cows in the countries of the European Union and in the most widespread control systems of after calving individuals during a transition period till recently remained substantially unexplored, except for the works reporting about the high frequency of occurrence of this pathology and also for the big economic losses of dairy production, related until recently (McKay, 2012).

The recent research conducted from May 2011 till October 2012 in 10 European countries showed that in dairy production the prevalence of cattle's ketosis, defined as a high concentration of  $\beta$ -hydroxyoleic acid in serum of blood in cows was ranging from 21.8 to 36.6% [1-4].

Frequency of occurrence of level of ketosis at individuals in dairy herd was the lowest in the United Kingdom and Italy (31%) and was much higher in Germany (43%), in the Netherlands (46%) and in France (53%). In five of the studied countries the average value of prevalence of ketosis in herd of young dairy cows in the range of observation from 1 to 3 weeks after calving made 41%, while the observation within 35 days after calving gave the frequency of diagnostics of a clinical stage of ketosis only in 1.6% [5-8].

According to the definition [9, 10] ketosis or the acetonemia is the metabolic disorder which is characterized by abnormal increase in ketone bodies in blood of dairy cows which, usually, happens in the postnatal period, between the 2nd and 6th week after calving. Economic factors of production to the great extent suffer from influence of ketosis, because of the decrease in production of milk, because of the costs of treatment of individuals, because of the increased risk of a susceptibility to other diseases, the decrease in efficiency of reproduction and more other risks [11-13].

In clinical aspect of veterinary science a ketosis in dairy cows, is more often described in scientific publications as subclinical ketosis. The main aspects of a research of ketosis already occur in the scientific periodical press from the beginning of 1950ies (Holmes, 1950). Later on, because of the increase in productivity and the expansion of production of dairy products this metabolic disorder became more widespread. This led to the appearance of new scientific works [14-20].

**Work objective:** histology of meat products from cattle with ketosis.

**Methods.** Meat products of forcibly killed cows were used for histological examination. The sample was taken from muscle, liver, kidney and heart of the cow. Obtained samples were put into 10% aqueous solution of 10×10×4 mm of formalin and then painted with hematoxylin eosin using standard method. The microscopy was performed using microscope. The stereometric analysis was carried out using the measuring grid.

**Results.** According to histology, dystrophic changes of different levels were noted in skeletal muscles, liver, kidneys and heart. Protein and fatty degeneration in liver cells have been identified as stable and consistent. Hepatocytes in histological preparations painted with hematoxylin eosin were in high level and their cytoplasm had small, large empty interspaces.

Hepatic volumes were noted as expanded and rounded, and interspaces in cytoplasm composed large volumetric pores. Such interspaces in some hepatocytes occupied completely all cytoplasm and the cell nucleus shifts to the edge of the cytoplasm. Small vessels are depressed and abnormal. As well as, proliferation of reticuloendothelial and mononuclear macrophage system cells has been constantly noted in all histologic preparations. They were found in reticular and lymphoid forms. Fat pieces in painted preparations were painted in red and brown. In the Schiff (PAS) reaction the amount of glycogen has decreased to the minimum in comparison to control group. The skeletal muscles are thickened at different levels, the horizontal strips are not clearly visible, and sarcoplasm had rounded grains and fat pieces painted with eosin in red. Also, the accumulation of fatty tissue in interstitial tissue caused atrophic compression of meat fibers. In the Schiff (PAS) reaction the amount of glycogen has decreased to the minimum in comparison to control group. The horizontal lines of the heart are almost invisible, and sarcoplasm had rounded grains and fat pieces painted with eosin in red. Also, the accumulation of fatty tissue in interstitial tissue caused atrophic compression of meat fibers. In the Schiff (PAS) reaction the amount of glycogen has decreased to the minimum in comparison to control group.

**Dicussion.** It was found that all the kidneys under test were damaged. These changes were caused by dystrophy and necrobiosis, as well as reflected as parenchymatous and adipose degenerations in epithelial cells of kidney's vertical holes. Some epithelial cells were destroyed by necrobiosis. Infiltration of polymorphic cells was noted in intermediate connective tissue. In the Schiff (PAS) reaction the amount of glycogen has decreased to the minimum in comparison to control group.

**Conclusion.** According to histology results, internal organs of dairy cows differed in the presence of parenchymatous, adipose and carbohydrate degenerations.

#### REFERENCES

- [1] Agresti A. 2002a. Analyzing repeated categorical response data. Pages 455–490 in *Categorical Data Analysis*. John Wiley & Sons Inc. New York, NY.
- [2] Agresti A. 2002b. Multinomial response models. Pages 267–302 in *Categorical Data Analysis*. John Wiley & Sons Inc., New York, NY.
- [3] Andersson L. 1988. Subclinical ketosis in dairy cows. *Vet. Clin. North Am. Food Anim. Pract.* 4:233–251.
- [4] Andersson L., Emanuelson U. 1985. An epidemiological study of hyperketonaemia in Swedish dairy cows; determinants and the relation to fertility. *Prev. Vet. Med.* 3:449–462.
- [5] Asl A.N., Nazifi S., Ghasrodashti A.R., Olyaei A. 2011. Prevalence of subclinical ketosis in dairy cattle in the South-western Iran and detection of cutoff point for NEFA and glucose concentrations for diagnosis of subclinical ketosis. *Prev. Vet. Med.* 100:38–43.
- [6] Amory J.R., Barker Z.E., Wright J.L., Mason S.A., Blowey R.W., Green L.E. 2008. Associations between sole ulcer, white line disease and digital dermatitis and the milk yield of 1824 dairy cows on 30 dairy cow farms in England and Wales from February 2003–November 2004. *Prev. Vet. Med.* 83:381–391. <http://dx.doi.org/10.1016/j.prevetmed.2007.09.007>.
- [7] Archer S.C., Green M.J., Huxley J.N. 2010. Association between milk yield and serial locomotion score assessments in UK dairy cows. *J. Dairy Sci.* 93:4045–4053. <http://dx.doi.org/10.3168/jds.2010-3062>.
- [8] Alban L. 1995. Lameness in Danish dairy cows: Frequency and possible risk factors. *Prev. Vet. Med.* 22:213–225.
- [9] Bicalho R.C., Warnick L.D., Guard C.L. 2008. Strategies to analyze milk losses caused by diseases with potential incidence throughout the lactation: A lameness example. *J. Dairy Sci.* 91:2653–2661. <http://dx.doi.org/10.3168/jds.2007-0744>.
- [10] Batanova O.V., Jelenshleger A.A. *Morfologicheskie i biohimicheskie pokazateli krovi u korov pri ketoze // Molodezh'* Barnaul. Barnaul, 2005. P. 316-317.
- [11] Batanova O.V., Jelenshleger A.A. *Lechenie korov, bol'nyh ketozom // Vestnik Altajskogo gosudarstvennogo agrarnogo universiteta*. Barnaul, 2006. P. 40-42.
- [12] Batanova O.V., Jelenshleger A.A. *Profilaktika subklinicheskogo ketoza korov // Vestnik Altajskogo gosudarstvennogo agrarnogo universiteta*. Barnaul, 2006. P. 32-34.
- [13] Batanova O.V., Dutova O.G., Jelenshleger A.A. *Funkcional'noe sostojanie shhitovidnoj zhelezy pri lechenii ketoza korov // Sibirskij Vestnik sel'skohozjajstvennoj nauki*. Krasnoobsk, 2007. P. 66-68.
- [14] Batanova O.V., Jelenshleger A.A. *Tireoidnyj status korov pri ketoze // Aktual'nye problemy sel'skogo hozjajstva gornyh territorij*. Gorno-Altajsk, 2007. N 1. P. 57-59.
- [15] Batanova O.V. *Soderzhanie ketonovyh tel i tireoidnyh gormonov v krovi korov pri ketoze // Veterinarija*. 2008. N 2. P. 43-45.

[16] Baird G.D., 1982. Primary ketosis in the high-producing dairy cow: Clinical and subclinical disorders, treatment, prevention, and outlook. *J. Dairy Sci.* 65:1–10.

[17] Barker Z.E., Amory J.R., Wright J.L., Blowey R.W., Green L.E. 2007. Management factors associated with impaired locomotion in dairy cows in England and Wales. *Dairy J. Sci.* 90:3270–3277.

[18] Barker Z.E., Leach K.A., Whay H.D., Bell N.J., Main C.J. 2010. Assessment of lameness prevalence and associated risk factors in dairy herds in England and Wales. *Dairy J. Sci.* 93:932–941.

[19] Bicalho R.C., Warnick L.D., Guard C.L. 2008. Strategies to analyze milk losses caused by diseases with potential incidence throughout the lactation: A lameness example. *Dairy J. Sci.* 91:2653–2661.

[20] Borchardt S., Staufenbiel R. 2012. Evaluation of the use of nonesterified fatty acids and  $\beta$ -hydroxybutyrate concentrations in pooled serum samples for herd-based detection of subclinical ketosis in dairy cows during the first week after parturition. *Am J. Vet. Med. Assoc.* 240:1003–1011.

**А. А. Жангабулова<sup>1</sup>, А. З. Мауланов<sup>2</sup>, А. А. Жумагелдиев<sup>1</sup>**

<sup>1</sup>Кафедра «Ветеринариялық-санитариялық сараптау және гигиена»  
Қазақ ұлттық аграрлық университеті, Алматы, Қазақстан,

<sup>2</sup>Кафедра «Биологиялық қауіпсіздік» Қазақ ұлттық аграрлық университеті, Алматы, Қазақстан,

### **КЕТОЗБЕН АУЫРҒАН ІРІ ҚАРА МАЛ ЕТ ӨНІМДЕРІНІҢ ГИСТОЛОГИЯСЫ**

**Аннотация.** Кәзіргі кезде кетоз әлемнің барлық елдеріндегі сүт бағытындағы малшаруашылықтарында тіркеледі. Кетозға бірінші кезекте жоғары өнім беретін жануарлар шалдығытыны анықталған. Кетоз өте зілді клиникалық белгілермен өтеді және кейде өліммен аяқталатыны байқалған. Ауырған сиырлардың сүт өнімі төмендейді, емделгеннен кейін оның бұрынғы деңгейдегі сүт өнімі қалпыны келмейді.

**Түйін сөздер:** кетоз, гистология, дистрофия, гематоксилин эозин, гепатоцит, патологоанатомия.

**А. А. Жангабулова<sup>1</sup>, А. З. Мауланов<sup>2</sup>, А. А. Жумагелдиев<sup>1</sup>**

<sup>1</sup>Кафедра «Ветеринарная-санитарная оценка и гигиена»,  
Казахский национальный аграрный университет, Алматы, Казахстан,

<sup>2</sup>Кафедра «Биологическая безопасность»,  
Казахский национальный аграрный университет, Алматы, Казахстан

### **ГИСТОЛОГИЯ МЯСА ПРИ КЕТОЗЕ**

**Аннотация.** В настоящее время кетоз зарегистрирован в животноводческих молочных фермах во всех странах мира. Кетоз проходит через крайние клинические симптомы и иногда заканчивается смертью. При болезни кетоза уменьшается подукт молока, и после лечения у нее не будет предыдущего молочного продукта.

**Ключевые слова:** кетоз, гистология, дистрофия, гематоксилин эозин, гепатоцит, патологоанатомия.

## **Publication Ethics and Publication Malpractice in the journals of the National Academy of Sciences of the Republic of Kazakhstan**

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the described work has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct ([http://publicationethics.org/files/u2/New\\_Code.pdf](http://publicationethics.org/files/u2/New_Code.pdf)). To verify originality, your article may be checked by the Cross Check originality detection service <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of Sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of Sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

[www:nauka-nanrk.kz](http://www.nauka-nanrk.kz)

<http://agricultural.kz/>

Редактор *М. С. Ахметова, Т. М. Апендиев, Д. С. Аленов*  
Верстка на компьютере *Д. Н. Калкабековой*

Подписано в печать 07.02.2018.  
Формат 60x881/8. Бумага офсетная. Печать – ризограф.  
8,25 п.л. Тираж 300. Заказ 1.