Impact Factor:					
	ISRA (India) = 4.971	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 0.829	РИНЦ (Russia) = 0.126	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 8.997	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 5.667	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2021 **Issue:** 01 **Volume:** 93

Published: 09.01.2021 **http://T-Science.org**

QR – Issue QR – Article

Birzhan Pshimbaevich Sultanov
S. Seifullin Kazakh Agrotechnical University (KazATU)
assistant of the department "Veterinary Sanitation"

Kamila Talgatovna Amanzholova
S. Seifullin Kazakh Agrotechnical University (KazATU)
5th year student

RAPID TEST METHOD FOR MEAT SAFETY DETECTION

Abstract: *This paper describes the rapid test method for meat safety detection based on the catalase enzyme level in blood that depends on the state of animal organism health before slaughter. This method enables to determine the meat produced from dead animals, killed in a state of agony or sick animals.*

Key words: *rapid test method, determination of meat quality and safety, meat from fallen and sick animals, poorly bloodless carcass.*

Language: *English*

Citation: Sultanov, B. P., & Amanzholova, K. T. (2021). Rapid test method for meat safety detection. *ISJ Theoretical & Applied Science, 01 (93),* 59-61.

Soi: http://s-o-i.org/1.1/TAS-01-93-10 ***Doi***: crossref https://dx.doi.org/10.15863/TAS.2021.01.93.10

Scopus ASCC: *1106.*

Introduction

Food safety and consumers' protection is one of the main priorities of governments in all countries [1, 2, 3]. Safe and healthy food is an essential factor in the functioning society and is critical for the economy in any country [4, 5, 6]. Nowadays, the Ministry of Agriculture has been assigned a number of urgent tasks aimed to produce and export meat of slaughter animals, as well as to improve its quality and safety. Under the government's statements, there are issues associated with the lack of control at the border of our states besides the positive consequences of Eurasian integration. One of these issues is the increase of counterfeit and falsified products in the markets. These products directly harm the health of the population and contribute to unfair competition in the food market along with deliberately misleading the consumer about the properties and origin of products.

Currently, food products can contain a whole range of foreign substances from different groups; there are also many ways to counterfeit food products [7].

One of the most important tasks of all consumers is to purchase high-quality, safe and non-falsified products. The latter, unfortunately, makes ever-greater turnover in food markets, while the regulatory authorities do not have time to identify and seize all counterfeit products. The problem of food counterfeiting turns out in almost all countries, both developed and developing ones. Many scientists address the issue of the safety of counterfeit products and study the methods to identify them [8, 9, 10, 11, 12].

Currently, many existing quality control and food safety methods have lost their relevance and significance in their rapidity, and the ones used most often rely on qualitative parameters such as color change, sediment appearance, etc. A laboratory expert is usually limited in the choice of modern, fast and effective methods, since the equipment of most of them leaves room for improvement. Therefore, the development of rapid methods for quality control of food products is an urgent problem, especially for the detection of contaminants, foreign substances, as well as various falsifications.

Description of the research methodology

The method enables to detect meat falsification produced from dead or sick animals that is a danger to the consumers' health. Meat safety is determined indirectly by the level of blood catalase enzyme that

depends on the animal organism's health before slaughter.

The method is performed using hydrogen peroxide (H_2O_2). The principle of the method is that the hydrogen peroxide added to the meat extract reacts with the enzymes present in the blood and mainly with catalase resulted in the release of oxygen, while a stable column of foam is formed (Fig. 1), the foam amount depends on the degree of animal carcasses bloodlessness. Moreover, the worse the bloodless degree, the more foam is formed. According to many authors, the catalase activity is higher in the erythrocytes of sick animals [13, 14]. Besides, the protein fractions of the meat extract (juice) are clarified under the influence of hydrogen peroxide, where the optical density is subsequently determined.

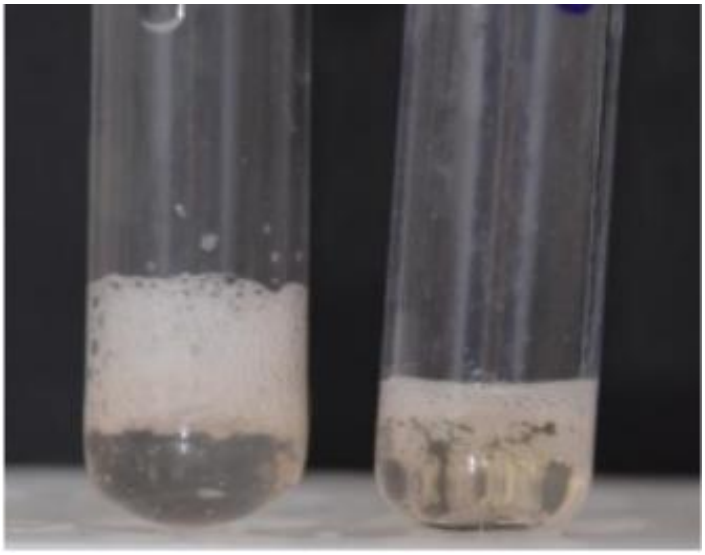

Figure 1 – The amount of foam formation in meat produced from a sick animal (left) and from a healthy animal (right)

Procedure:

1. Prepare meat extract in a ratio of 1:10.
2. Add 1 ml of the filtered extract to a measuring tube.
3. Add 5 drops of 5% hydrogen peroxide solution to the extract and stir vigorously.
4. Measure the height of firmly formed foam.
5. Measure the optical density of the clarified extract.

Evaluation of the result: The firm foam column more than 0.5 cm in height is formed in meat produced from sick animals. Foam does not form or only slightly covers the extract surface (up to 0.5 cm) in meat of healthy animals.

Conclusion

Thus, this rapid method can serve as one of the additional methods to determine the quality and safety of meat because the carcass bleeding off degree is one of the objective parameters that provides information about the state of the animal before slaughter, the worse the carcass is bloodless, the more doubts arise about the health of the animal.

References:

1. Borisenko, E.N. (1996). K voprosu o mezhdunarodnoj prodovol'stvennoj bezopasnosti. *Bezopasnost'*, № 7/12, pp. 63-70.
2. Antipova, L.V., & Soskova, N. A. (2000). *Rol' tekhnologicheskih processov v obespechenii biologicheskoj bezopasnosti pitaniya*. (p.302). Moscow: RosAko APK.
3. Donchenko, L.V., & Nadykta, V.D. (1999). *Bezopasnost' pishchevogo syr'ya i produktov pitaniya*. (p.360). Moscow: Pishchepromizdat.

4. Ivankin, A.K., Berdutina, A.V., & Neklyudov, A.D. (2001). Ob ekologicheskoj bezopasnosti pishchevyh produktov. *Ekol. sistemy i pribory*, №8, pp. 39-44.
5. Ivankin, A.N., et al. (1999). Ekologicheskaya bezopasnost' myasnyh produktov. Analiz antibiotikov. *Hranenie i pererabotka sel'hozsyr'ya*, №3, pp. 27-30.
6. Poznyakovskij, V.M. (2005). *Gigienicheskie osnovy pitaniya, kachestvo i bezopasnost' pishchevyh produktov:* ucheb.dlya vuzov. 4-e izd., ispr. i dop. (p.522). Novosibirsk: Sib. univ. izd-vo.
7. (2002). *Food energy – methods of analysis and conversion factors. FAO, Food and nutrition paper*. Report of a technical workshop Rome, 2002, 3-6 December.
8. Zhulenko, V.N., Rabinovich, M.I., & Talanov, G.A. (2002). *Veterinarnaya toksikologiya*. (p.384). Moscow: Kolos.
9. Zhuravskaya, N.K., Gutnik, B.E., & Zhuravskaya, N.A. (2001). *Tekhnohimicheskij kontrol' proizvodstva myasa i myasoproduktov*. (p.476). Moscow: Kolos.
10. Ivankin, A.N., Neklyudov, A.D., Suhanova, S.I., & Galkin, A.V. (1998). Analiz ostatochnogo soderzhaniya vrednyh preparatov v myasnyh produktah s ispol'zovaniem metoda ELISA. *Myasn. Industriya*, №3, pp. 49-51.
11. Egorov, N.S. (1986). *Osnovy ucheniya ob antibiotikah.* 4-e izd., pererab. i dop. - Moscow: Vysshaya shk.
12. Hudobina, O.A., & Safonova, I.L. (1976). Problemy kontrolya toksichnosti himicheskih produktov v SSHA. *Himicheskaya promyshlennost' za rubezhom*, Vyp. 5, pp. 27-31.
13. Issi, M., Gul, Y., & Yilmaz, S. (2008). Clinical, haematological and antioxidant status in naturally poxvirus infected sheep. *Revue Méd. Vét.*, 159, 1, pp.54-58.
14. Kassabova, T., Staykova, M., Balevska, P., Atanassov, B., & Goranov, I. (1990). Antioxidant capacity of spinal cord and erythrocytes of guinea pigs in case of experimental allergic encephalomyelitis and after disease suppression. *Acta Neurol Scand*, 1990 Aug., 82(2):116-20.