HORIUK Yuliia, Doctor of Veterinary Sciences, Assoc. Prof
HORIUK Viktor, PhD of Veterinary Sciences, Assoc. Prof.
Higher Educational Institution «Podillia State University»
Kamianets-Podilskyi, Ukraine

ANALYSIS OF PATHOGENIC PROPERTIES OF STAPHYLOCOCCI – HOSTS OF LYTIC BACTERIOPHAGES

Coagulase-positive staphylococci are opportunistic opportunistic pathogens, and when coagulase-positive staphylococci are isolated, they are usually considered to be Staphylococcus aureus [1]. These pathogens are characterized by a number of regulatory mechanisms for controlling the synthesis of its numerous pathogenicity factors in response to external stimuli. These include toxin formation, plasma coagulation, formation of hemolysins, lecithinase activity, formation of DNAse, phosphatase, lipase, etc. These pathogenic properties ensure the survival of bacteria in the environment of the mammary gland, protect staphylococci from the influence of the animal's immune system, promote the development of inflammatory processes and the colonization of pathogens [2]. So, in order to determine the participation of these microorganisms in the etiology and pathogenesis of mastitis, it is necessary to determine its pathogenic properties.

The table shows the results of a study on the determination of the types of toxins produced by strains of Staphylococcus aureus. Cultures were tested using the RIDASCREEN®SET A, B, C, D, E test system ("R-Biopharm AG", Darmstadt, Germany). The study was carried out in three repetitions.

Table

Types of enterotoxins produced by S. Aureus,%, n =27

The biotope from which S. aureus was isolated	Number of cultures that produced enterotoxins:				
	SEA	SEB	SEC	SED	SEC/D
The skin of the udders of healthy cows, n=2	0	0	50	50	0
The skin of udders of cows suffering from mastitis, n=8	0	0	25	37,5	37,5
The secret of the udder of sick cows, n=17	0	0	5,8	70,6	23,5

Notes: SEA – type A enterotoxins, SEB – type B enterotoxins, SEC – type C enterotoxins, SED – type D enterotoxins, SEC/D – type C and D enterotoxins

As can be seen from the data in the table, staphylococci isolated from the secretion of cows with mastitis produced enterotoxins of type D (70.6%), the ability to produce toxins of type C was detected only in 1 culture (5.8%) and a mixed type of enterotoxigenicity (SEC/D) was detected in 4 strains (23.5). It was also established that the skin of udders of cows suffering from mastitis was

studded with staphylococci that produced SED and SEC/D toxins in equal amounts – 37.5%, a slightly smaller number of cultures produced SEC-type toxins (by 1.5 times). Two cultures, which were isolated from the udder skin of healthy cows, showed toxigenicity with production of toxin types C and D in equal amounts. Toxins of types SEA and SEB were not produced by cultures isolated from different biotopes of dairy farms. It is known that the cultures of staphylococci of the bovine biotype produce, mainly, toxins of types C, D and C/D, which indicates the manifestations of clinical and subclinical forms of mastitis [3].

Therefore, the obtained research results confirm the important role of enterotoxigenic strains of Staphylococcus aureus in the pathogenesis of mastitis and indicate that healthy animals can also be a reservoir of staphylococci with pathogenic properties.

References

1. Inside job: staphylococcus aureus host–pathogen interactions / J. Horn et al. *International journal of medical microbiology*. 2018. Vol. 308, no. 6. P. 607–624. DOI: https://doi.org/10.1016/j.ijmm.2017.11.009
2. Fetsch A., Johler S. Staphylococcus aureus as a foodborne pathogen. *Current clinical microbiology reports*. 2018. Vol. 5, no. 2. P. 88–96. DOI: https://doi.org/10.1007/s40588–018–0094–x
3. Biotype characterization of Staphylococcus aureus from milk and dairy products of private production in the western regions of Ukraine / M. D. Kukhtyn et al. *Regulatory mechanisms in biosystems*. 2017. Vol. 8, no. 3. P. 384–388. DOI: https://doi.org/10.15421/021760