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ESTIMATION OF TREATMENT SCHEMES EFFICIENCY OF BACTERIAL MASTITIS IN DAIRY COWS AND ANTIBIOTIC RESISTANCE OF IDENTIFIED PATHOGENS.

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Introduction

Mastitis is a disease of major economic importance in dairy industry worldwide. Most infections are caused by various species of streptococci (or similar gram-positive cocci), staphylococci, and gram-negative rods. Diagnosis of subclinical infection is more problematic since the milk appears normal.

The aim of the study was to isolate the pathogen associated with cow mastitis and determine its sensitivity to antibiotics.

Material and methods

The research was done on the herd (n=3000) of cows of black-motley breed with an admixture of Holstein in the Central Federal Districts of Russia. At the first stage, the diagnosis was carried out by using the Keno test. For treatment there were used the schemes tried and tested in the farm: (1) nisin, polymexin B, ketoprofen, methyl salicylate; (2) nisin, polymexin B, ketoprofen, ceftiofur; (3) amoxicillin, ketoprofen, methyl salicylate, prednisone.

At the second stage, samples of milk, nasal and vaginal mucus were taken from animals with a relapse of mastitis. Different pathogens (HiMedia laboratories private limited, India) were used to isolate pathogens (*Clostridium perfringens, Staphylococcus aureus, Escherichia coli, Streptococcus agalactiae, Shigella spp., Enterococcus spp., Ps. aeruginosa*).The extracted isolates were identified based on the cultural and biochemical properties (BioMerieux, France). The sensitivity testing of the isolated strains was performed by the disk diffusion method (DDM). The results were interpreted on the recommendation of The European Committee on Antimicrobial Susceptibility Testing (EUCAST).

Results

After the first diagnosis there were selected 148 (4.9%) goals who had the signs of subclinical and clinical forms of mastitis. After treatment, the number of repeated cases of the disease reached 44.6%, which indicated the ineffectiveness of the treatment regimens used.

Of all the animals examined, they simultaneously detected in milk 3 pathogens in 37.8%, 2 pathogens in 40.9%, and only one pathogen was isolated in 21.3%. Moreover, *S. aureus* (84.8%), *Ps. aeruginosa* (62.1%), *Enterococcus spp.* (34.8%) was found in smears from the vagina. *S. epidermidis*, *S. aureus*, and *Shigella spp*. were found in the mucus of the nasal cavity of all animals. The sensitivity of the selected pathogens to antimicrobials showed that 73% of S. aureus strains were resistant to ≥6 antibiotics, 47% *E. coli* to ≥7, 34% *Shigella spp*. to ≥4, 21% *Ps. aeruginosa* to ≥4.

Table 1. Prevalence of mastitis in dairy cows

Observation	Overall mastitis			Clinical mastitis	Subclinical mastitis
	No examined	No pos	Prevalence (%)	No (%)	No (%)
Cow-level	3000	148	4,9	9 (6,1)	139 (93,9)

Table 2. Antibiotic susceptibility of pathogen strain

Pathogen	Antibiotics	Total strain – number	Resistant strain, (%)
S. aureus	Pen+GN+ER+LN+RF+CP+FZ	328	72,87
E. coli	AM+CF+ChL+MER+AMI+COL	137	46,72
Shigella spp.	AM+TET+CP+GN	35	34,29
Ps. aeruginosa	GN+CIP+MEM+CRO	56	21,43

Penicillin (Pen), Amikacine (AMI), Ampicillin (AM), Ceftazidim (CF), Ceftriaxone (CRO), Chloramphenicol (ChL), Ciprofloxacin (CP), Ciprofloxacin (CIP), Colistine (COL), Erythromycin (ER), Fuzidin (FZ), Gentamicin (GN), Lincomycin (LN), Meropenem (MER), Meropenem (MEM), Rifampicin (RF), Tetracycline (TET)

Conclusion: the use of antibiotics of different groups without isolating the pathogen and determining its sensitivity leads to the appearance of multiresistant strains of bacteria and culling animals from the herd.

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