

THE EFFECT OF THE USE OF TISSUES WITH THE ADDITION OF SILVER AND COPPER NANOPARTICLES APPLIED TO HYGIENE UDDER OF DAIRY COWS BEFORE MILKING *

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Mastitis is caused by various strains of bacteria, fungi, and algae. Pathogens that cause mastitis in dairy cows are more and more often resistant to treatment with conventional methods (antibiotics), which is why scientists are looking for new solutions for the treatment of mastitis. The main form of treatment and prophylaxis of mastitis is antibiotic therapy, the effectiveness of which decreases due to the increase in bacterial resistance to the drugs used. The cause of this phenomenon is the excessive use of antibiotics in the treatment of animals, contributing to the emergence of strains resistant to therapies. One of the ways to eliminate microorganisms is the use of nanoparticles. The aim of the research was to determine the bactericidal properties of silver and copper nanoparticles as an addition to cow udder hygiene tissues.

Disposable udder hygiene wipes have been impregnated with silver and copper nanoparticles. The research was carried out in a herd of dairy cows, which was located in south-eastern Poland. The experiment used 10 Polish Holstein-Friesian cows. In each cow, 2 control teats and 2 test teats were selected. The control teats were cleaned using wipes without the addition of nanoparticles, and the test teats were cleaned using wipes impregnated with silver and copper nanoparticles. After testing, all tissues were placed in sterile cups. Each sterile cup used in the experiment contained 40 ml of 0,1 NaCl. After 12 hours, microbiological analysis was carried out to determine the pathogens found on the tissues.

The results showed that 98% of tissues were pathogens causing mastitis (*Streptococcus uberis*, *Streptococcus dysgalactiae*, *Escherichia Coli*). The cultures made of nanoparticle tissues were characterized by a smaller number of microorganisms. The experiment showed the bactericidal properties of silver and copper nanoparticles. The research results indicate a further need to carry out scientific work to develop new products with nanoparticles used in the treatment and prophylaxis of mastitis in dairy herds.

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