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«Effect of ultrasonic cavitation on the grain of meat
when lamb salting»

Authors:

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- **The aim of the study** was to study the effect of ultrasonic treatment on the microstructure of muscle tissue when wet lamb salting.



Materials and methods. Isolated from the hip, cooled lamb meat with natural autolysis process was used. The mass of the pieces was 300 ± 50 grams ($n = 6$). Ultrasound meat salting was carried out with using of the “PSB-Gals” device (Russia) with an ultrasonic frequency of 35 kHz and an ultrasound intensity of 1 W/cm^2 (Fig. 1a), and an ultrasonic immersion emitter with an ultrasonic frequency of 26 kHz and an ultrasound intensity of 1 W/cm^2 (Fig. 1b) for 5 hours. The brine contained sodium chloride (7%), sugar (1.5%) and sodium nitrite (0.015%). The density of the brine was 1050 kg / m^3 .

Results

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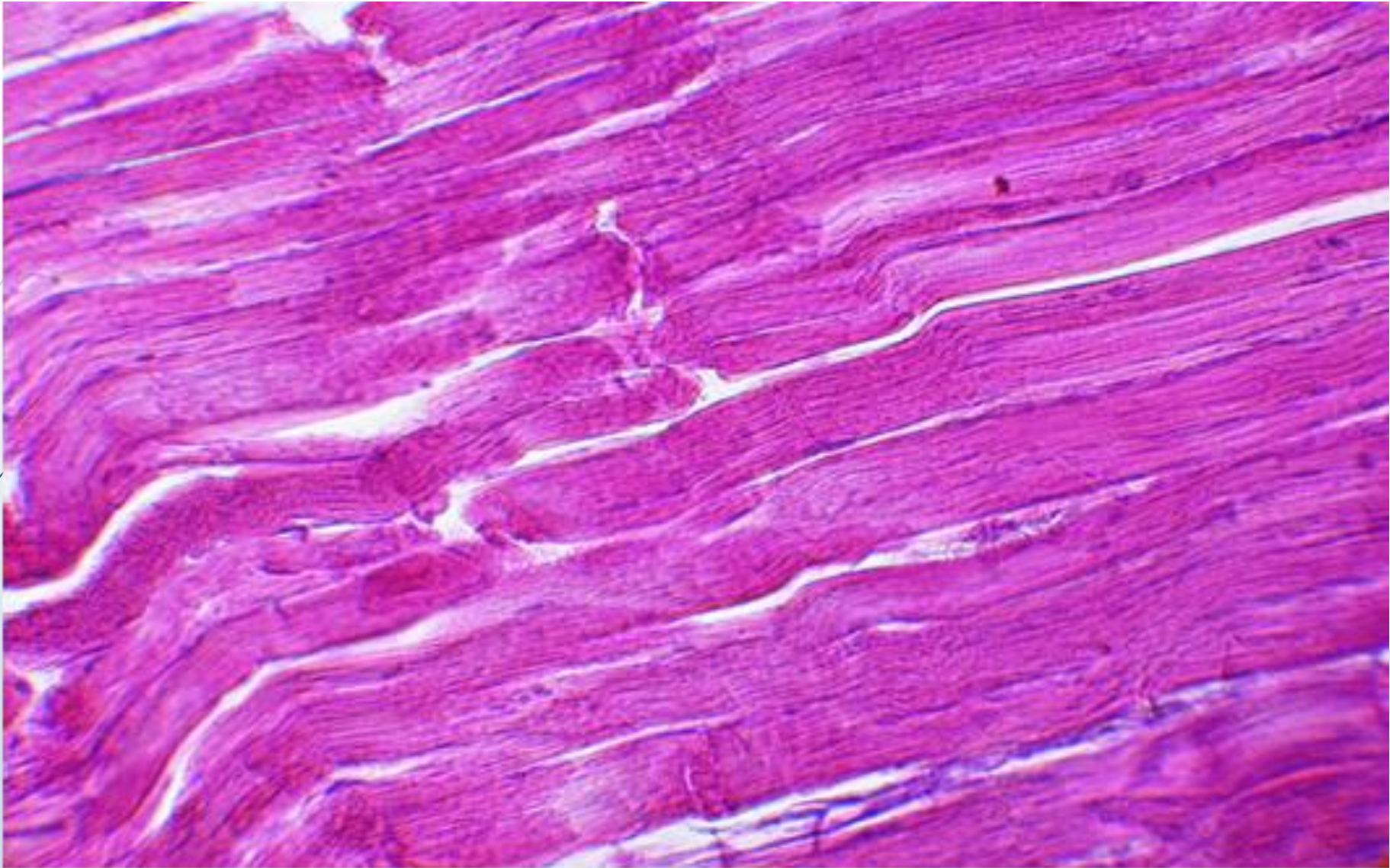


Figure 1. Lamb. The natural autolysis process. Ehrlich hematoxylin and eosin staining. $\times 300$

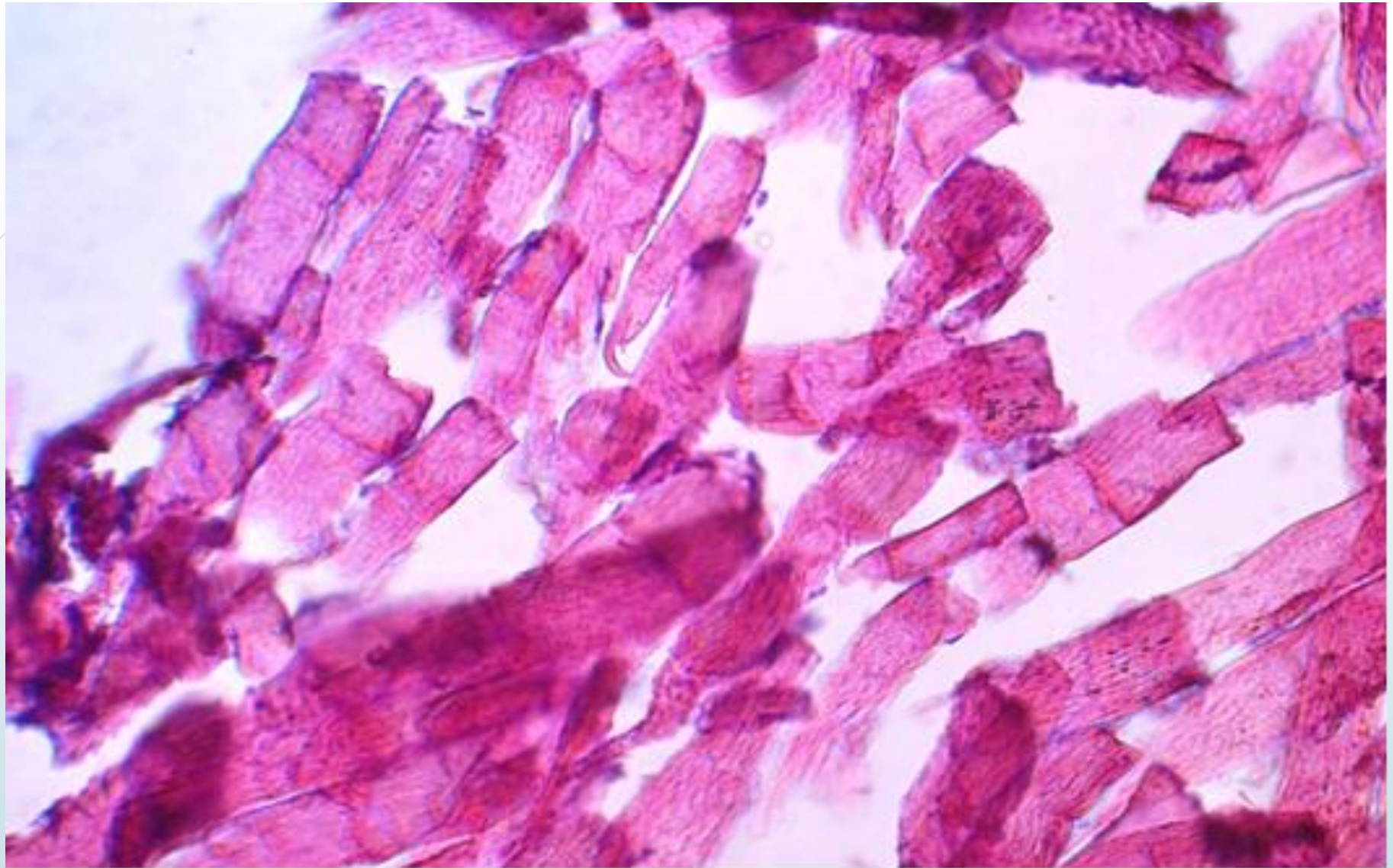


Figure 2. Lamb. Salting 35 kHz, 1 W/cm² 5 hours.
Ehrlich hematoxylin and eosin staining. × 300

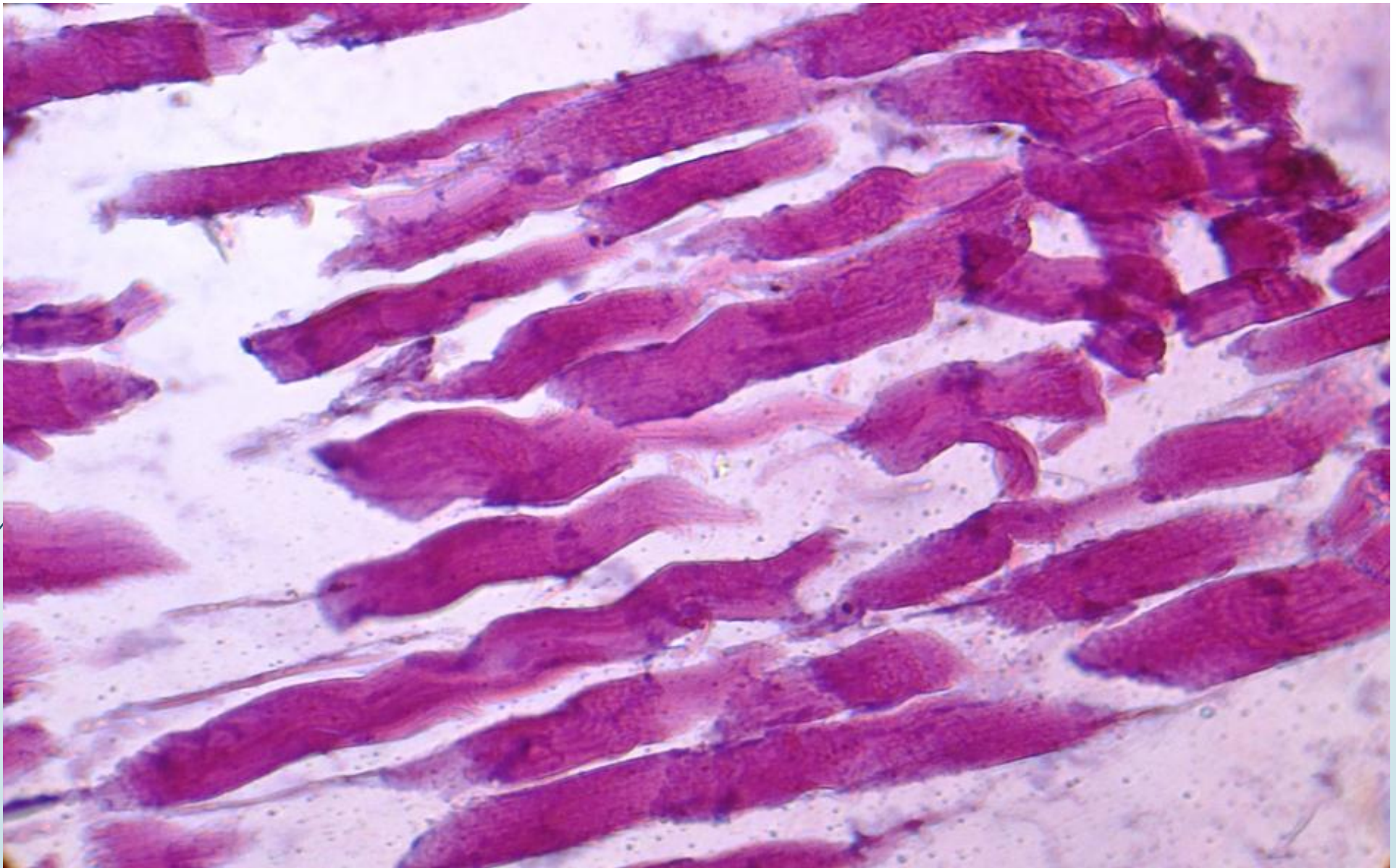


Table 3. Lamb. Salting 26 kHz, 1 W/cm² 5 hours. Ehrlich hematoxylin and eosin staining. × 300

Conclusion:

The results of our research allow us to conclude that the use of low-frequency ultrasound in the salting process accompanies increasing of transverse microcracks and cracks number in the muscle fibers, leading to their fragmentation. Along with the destruction of muscle fibers, local destruction of the sarcolemma occurs. These processes promote the penetration of brine between the muscle fibers and accelerate the diffusion of salt into the fibers. It should be noted that ultrasonic cavitation at 26 kHz has a less destructive effect on the muscle tissue, which is important for the organoleptic properties of the finished product and can affect its safety.