and catalase activity significantly decreased in the brain of animals of the experimental group 5 by 39 and 31%, respectively, compared to the values of the group 3. However, the level of lipid hydroperoxides in the brain of animals of group 5 (39%) compared to the group 3 was by 42% lower than the level of lipid hydroperoxides in the brain of rats of group 2 (81%) compared to group 1. Catalase inactivation in the brain of animals of group 5 (31%) compared to group 3 was by 23% lower than the inhibition of catalase activity in the brain of rats of group 2 (54%) compared to group 1.

Thus, Cr(VI)-induced toxicity causes a disturbance in the pro/antioxidant balance in rat brain tissue by stimulating lipid peroxidation and inhibiting catalase activity. However, the Cr(VI)-induced increase in lipid hydroperoxides content and catalase inactivation were twofold lower after pretreatment with ETS at the tested dose.

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PROSPECTS FOR USE OF A NATURAL SULFURIC COMPOUND PROPYL PROPANE THIOSULFONATE IN THE FIELD OF ANIMAL HUSBANDRY

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Organosulfur compounds are organic molecules composed of sulfur atoms bonded to carbon atoms. Edible plants of the genus *Allium*, such as garlic (*Allium sativum*) or onions (*Allium cepa*), contain a large number of different types of sulfur compounds. These compounds are responsible for the characteristic pungent odor and taste of *Allium* vegetables and are also characterized by a wide

range of biological activities [Cascajosa-Lira, 2024]. Propyl propane thiosulfonate (PTSO) is an organosulfur compound isolated from *Allium spp*. PTSO is characterized by antimicrobial, antifungal properties and positive immunomodulatory effects that have been studied in many experimental models [Vezza, 2021].

In recent years, the use of natural preventive and therapeutic products in livestock production has become increasingly important due to growing restrictions on the use of drugs recommended by the Food and Agriculture Organization of the United Nations (FAO), the World Organization for Animal Health (WOAH) and the World Health Organization (WHO) [Cabello-Gómez, 2022]. In addition, after the European Union banned the use of growth stimulants and antibiotics in livestock, the demand for natural dietary supplements that increase animal productivity and help avoid the adverse effects of antibiotics has increased significantly [García-Nicolás, 2023].

Recent studies have shown that the use of PTSO is an effective way to increase productivity in the livestock industry [Foskolos, 2020; Sánchez, 2020; Cabello-Gómez, 2022; Rabelo-Ruiz, 2022; Rabelo-Ruiz, 2023; Villar-Patiño, 2023]. In particular, the introduction of encapsulated PTSO into the diet of broiler chickens at a dose of 250 mg/kg improves the absorption of amino acids and energy, and also contributes to an increase in the average daily weight gain in birds [Villar-Patiño, 2023]. Daily addition of PTSO to the diet of dairy cows at a dose of 250 mg/day/cow improves the efficiency of the respective diet by increasing the ratio of milk yield to dry matter consumption by 17% [Foskolos, 2020]. The introduction of *Allium spp*. extract (30 ppm of PTSO) into the feed increases the average daily gain of pigs and has a positive effect on the intestinal microbiota during 103 days of the experiment [Sánchez, 2020]. The use of PTSO as a feed additive for aquaculture of dorado (*Sparus aurata*) has a positive effect on the intestinal microbiota, while maintaining the productive parameters of young fish. The effect of PTSO at a dose of 150 mg/kg for 12 weeks contributes to a significant reduction in the number of potentially pathogenic *Vibrio* and *Pseudomonas*, an increase in the number of potentially beneficial *Lactobacillus* and Shannon's alpha diversity index in the intestine of fish [Rabelo-Ruiz, 2022]. Feeding fishmeal with the addition of PTSO (150 mg/kg) for 89 days reduces the number of pathogenic *Vibrio*, increases the number of beneficial *Pseudomonas* and *Kocuria* in the intestine and body weight of juvenile sea bass (*Dicentrarchus labrax*) [Rabelo-Ruiz, 2023]. The combined effect of PTSO and propylpropanthiosulfinate (150 mg/kg of the mixture in a 1:1 ratio) on the 21st day of feeding increases the probability of survival of dorado by 37% and reduces the number of *Sparicotyle chrysophrii* parasites in the gills of fish by almost 7 times [Cabello-Gómez, 2022].

Thus, recent studies indicate that the use of the natural organosulfur compound PTSO as an alternative feed additive is a relevant way to increase productivity in the livestock industry. Given the ban on the use of antibiotics to stimulate growth in livestock, PTSO can be an effective natural analog that has a positive effect on growth performance and regulation of intestinal microflora in animals.

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INFLUENCE OF RESVERATROL ON THE REPRODUCTIVE CAPACITY OF ANIMALS

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Resveratrol was first isolated in 1939 from the roots of *Veratrum grandiflorum O. Loes* belongs to the polyphenolic phytoalexins of the stilbene family. This substance is present in grapes and wine, as well as in peanuts, soybeans, some types of berries and tea (Breuss et al., 2019; Pyo et al., 2020; Shetty et al., 2023). The basis for the use of resveratrol in veterinary reproductive medicine is its structural and functional homology with estrogen, which allows it to bind to nuclear estrogen receptors and regulate their activity (Horgan et al., 2019; Vašková et al., 2023; Koshevoy et al., 2024).

Resveratrol is a natural aryl hydrocarbon receptor antagonist and can modulate inhibition of NF-κB, cyclooxygenase, and lipopolysaccharide to reduce inflammation and ROS levels (Dull et al., 2019). It can also modulate ovarian function by influencing oocyte maturation and steroidogenesis, protect oocytes from aging, by activating the sirtuin-1 gene (Nishigaki et al., 2021). Activation of sirtuin-1 leads to an increase in luteinizing hormone and activation of gonadotropin-releasing hormone receptors in the ovaries, stimulates mitochondrial activity to increase antioxidant potential. It has also been shown that resveratrol can modulate down-regulation of inflammatory gene expression similar to insulin-like growth factor 1 (Novakovic et al., 2022).

Under the influence of resveratrol, hepatocyte growth factor is expressed in the peritoneal fluid of females with endometriosis, which inhibits prostaglandin F2α, which induces uterine contraction,