

Longevity and anti-fatigue effects of venison extract treated with high pressure

Kana Kogiso^{1,2}, Shinya Yamazaki³, Kazumasa Furuta⁴

¹ Faculty of Health and Human Development, The University of Nagano, ² Graduate School of Health and Nutrition Science, The University of Nagano, ³ Nagano Prefecture General Industrial Technology Center, ⁴ Fujitsu Limited, Japan

Objectives: Deer and wild boars often cause damage to crops in Japan. Such damage has a serious impact on farmers, as it reduces their willingness to engage in farming and increases the amount of abandoned farmland. Many of the animals caught are discarded. We want to make effective use of them as food resources rather than disposing of them. In our previous studies. Therefore, a soy sauce-like extract was made from gibier (venison) treated under high pressure, and its food functionality (anti-fatigue and longevity effects) was examined by *C. elegans*.

Materials and Methods: Preparation of the test substance <high hydrostatic pressure treatment (abbreviated as HPT)> is as follows. Deer back loins were stored at -20°C and thawed before use. After coarsely grinding with a commercial mincer, 0.75% of Protin SD-NY10 (Amano Enzyme) and 10% of water were added to the mince by weight. The bag containing the meat was vacuum-packed and kept at 50°C for 24 hours at high hydrostatic pressure (200 MPa) (Toyo Koatsu Co., Ltd.). The test substance was prepared extracts and heat sterilized at 100°C for 30 minutes. A non-HPT version was made as a comparison. *C. elegans var. Bristol* (N2 strain wild strain) was purchased from the *C. elegans* genetic center (CGC) at the University of Minnesota. In principle, the method of preparation of reagents, media, etc. used for *C. elegans* culture followed Brenner's method¹⁾. The life span of *C. elegans* was measured by measuring the number of surviving individuals every 2-3 days, and observations were made up to 26 days of survival to determine its prolongation effect. The anti-fatigue effects of nematodes were as follows. The synchronized nematodes were grown in HPT and in medium without HPT for 3 days, then flushed in a centrifuge and liquid cultured without food for 24 hours. The nematodes were then placed on agar medium, and 1% diacetyl, which the nematodes prefer, was placed 6.5 cm away and the extent to which they migrate in 10 min was observed. Component analysis about venison extract were used LC-MS(Waters, AC-QUITY-Xevo QToFMS) and L-8900 Amino Acid Analyzer (Hitachi High-Technologies Corporation).

Results and Discussion: The results of the experiment to measure the life extension effect of *C. elegans* indicated that HPT has a higher longevity effect than Cont. or venison. The results of the experiment on the anti-fatigue effect using *C. elegans* suggested that HPT may have an anti-fatigue effect. And the results of the experiment on the anti-fatigue effect using *C. elegans* indicated that HPT may have an anti-fatigue effect. Component analysis (LC-MS and imidazole peptide analysis) showed that HPT contained more imidazole peptides than venison.

Conclusions: A soy sauce-like extract was made from gibier (venison) treated under high pressure may have longevity and anti-fatigue effects due to the peptide component.

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