

Oral presentation | B 食品機能 (Food Function)

📅 Fri. Aug 29, 2025 9:00 AM - 11:00 AM JST | Fri. Aug 29, 2025 12:00 AM - 2:00 AM UTC 🏢 Room C(2F 123)

[3Ca01-08] 食品機能 脂質、コレステロール調節、認知機能

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9:45 AM - 10:00 AM JST | 12:45 AM - 1:00 AM UTC

[3Ca04] Anti-obesity effect and mechanistic action of garlic odor precursor, S-allyl-L-cysteine sulfoxide

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Keywords : Alliin、Uncoupling protein 1 (UCP1)、Metabolic syndrome

"Purpose" Metabolic syndrome has become a global issue. S-Allyl-L-cysteine sulfoxide (ACSO), a garlic odor precursor, possesses various functional properties and its tasteless, odorless, and water-soluble characteristics allow for extensive use in foods. Brown adipose tissue contributes to anti-obesity effects by utilizing surplus energy as heat via uncoupling protein 1 (UCP1)-mediated thermogenesis. The purpose of this study is to clarify the effects of ACSO on adipocyte heat production and fat mass.

"Methods" C3H 10T1/2 cells were differentiated into adipocytes and changes in lipid accumulation following ACSO treatment were evaluated by fluorescence staining. The effects of ACSO on UCP1 expression were analyzed using Western blotting. *In vivo* experiments were conducted by orally administering ACSO to C57BL/6J mice, followed by evaluation of its effects on body weight and adipose tissue weight gain induced by a high-fat diet. Additionally, the impact of ACSO on UCP1 expression in adipose tissue was examined.

"Results" In cell experiments, ACSO significantly reduced lipid accumulation. However, Western blotting indicated that ACSO did not affect UCP1 expression levels *in vitro*, suggesting ACSO suppresses intracellular lipid accumulation via mechanisms other than UCP1 activation. In contrast, *in vivo* experiments demonstrated that oral administration of ACSO inhibited high-fat diet-induced increases in body weight and adipose tissue weight, with a trend toward increased UCP1 expression in adipose tissue. These results suggest that orally administered ACSO exerts anti-obesity effects by enhancing UCP1 expression in adipose tissue, involving metabolic regulatory mechanisms *in vivo*.