

Accumulation of Dietary Conjugated Linoleic Acid (CLA) in Silkworm, *Bombyx mori*

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Conjugated linoleic acid (CLA) refers to a group of positional (8,10; 9,11; 10,12; 11,13) and geometric (*cis*, *trans*; *trans*, *cis*; *cis*, *cis*; and *trans*, *trans*) configurations of linoleic acid (C18:2) with a conjugated double bond system. CLA, found in variety of foods related to ruminant animals, has been reported to have anti-carcinogenic, hypocholesterolemic, and antiatherogenic effects in several animal models. We report here that dietary CLA synthesized chemically from corn oil or safflower oil is accumulated in silkworm, *Bombyx mori*, body which is used as a therapeutic agent for diabetes in Korea and Japan.

In the first trial, we tested the possibility of CLA accumulation in silkworm. Mulberry leaves treated with 0.1 or 10 % CLA in ethanol were supplied to silkworm from the end of the 3rd instar to the 3rd day of the 5th instar. The silkworm contained significantly higher amount of CLA (83.5 mg/g of lipid), when fed with mulberry leaves treated with 10% CLA.

The second trial was conducted to know the proper time initiating the supply of dietary CLA. Mulberry leaves sprayed with 1.0 or 10 % CLA in acetone were supplied to silkworm from the 3rd, the 4th, and the 5th instar to the 3rd day of the 5th instar. The initiation time providing CLA leaves did not affect the total lipid (%) to dry weight of silkworm body tissue, ranging from 17.7 to 24.3 %. The most amount of CLA (132.3 mg/g lipid) was accumulated in silkworm body tissue, when mulberry leaves sprayed with 10 % CLA solution were supplied to the insects from the 4th instar. The CLA contents in haemolymph and in the food stuff in intestines were analyzed separately.

In the two trials, no CLA was detected from the larvae fed with fresh leaves or leaves sprayed with corn oil or safflower oil.

Alcoholic and acetous CLA solutions sprayed on the mulberry leaves significantly affected larval development, resulting in a reduction of larval weight. The method how to feed the CLA to silkworm is a problem to be solved, if we want to produce, so called, 'CLA-silkworm'.