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Effect of administration of amino acids on the resistance to influenza virus infection in mice

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For the prevention and control of viral infections, vaccine is used to confer immune response specific to each pathogen on animals. On the other hand, various biologicals such as cytokines are tested for their prophylactic effects on the enhancement of non-specific immune response to confer the resistance to viral infections in animals. In the present study, the effect of administration of amino acids on the resistance of mice to influenza virus infection was examined.

Mice were fed diets supplemented with different amino acids. After the dietary period, influenza virus was intranasally inoculated into the mice. Virus infectivity titers in the lungs of the mice were measured on 5 days after the challenge. The results indicate that the supplementation of diet with glutamine and cystine confer the resistance to influenza virus infection on the animals.

Glutamine inhibited plaque formation of influenza virus in MDCK cell culture. Al-

though the mechanism of suppression of influenza virus replication in MDCK cells by glutamine is not well defined, the result of virological analysis indicate that it was neither due to direct interaction of glutamine with virions, inhibition of attachment of virions to the cellular receptor, or interference with penetration of virions into the host cells.

Mice fed diet supplemented with cystine showed higher antibody response to subcutaneous injection with an inactivated influenza virus vaccine compared to control mice. When vaccine was injected together with amino acids into mice, adjuvant effect was not observed.

The present results, thus, reveal that glutamine and cystine confer the resistance to influenza virus infection on mice non-specifically. These amino acids may be utilized as food supplements for domestic animals and humans.