Effects of grazing upon immunoglobulin levels in the milk of dairy cows

Mio Yamaguchi[1, 2], Rika Fukumori[1, 2], Borjigin Sarentonglaga,[1, 2], Kazuko Ogata [2,3], Asuka Hara[1, 2], Akane Sato [1, 2], Isamu Maeda[1, 4], Norihiro Azuma[1, 4], and Yoshikazu Nagao[1, 4*]

[1]Department of Animal Production Science, United Graduate School of Agricultural Science, Tokyo University of Agriculture and Technology, Tokyo 183-8509, Japan

[2]University Farm, Faculty of Agriculture, Utsunomiya University, Tochigi 321-4415, Japan

[3]Collaboration Center for Research and Development of Utsunomiya University, Tochigi 321-0904, Japan

[4]Faculty of Agriculture, Utsunomiya University, Tochigi 321-8505, Japan

short title: **Pasture intake and immunoglobulin levels in the milk**

[*]Correspondence: Yoshikazu Nagao,

University Farm

Faculty of Agriculture

Utsunomiya University

Tochigi 321-4415

Japan

phone 81-285-84-1321

FAX 81-285-84-1321

E-mail: ynagao@cc.utsunomiya-u.ac.jp

Summary

The objective of this study was to clarify the effects of grazing management immunoglobulin levels in the milk of dairy cows. There are three major classes of immunoglobulins in bovine milk: IgG, IgM, and IgA. They are able to prevent the adhesion of microbes to surfaces, inhibit bacterial metabolism, agglutinate bacteria, and neutralize toxins and viruses. Lactating dairy cows were managed in a rotational grazing system from 0900 – 1400 h from May to November 2011 (Grazing period) or in a paddock from November 2011 to January 2012 (No-Grazing period). Milk samples from grazing and no-grazing cows were analyzed for β-carotene, vitamin E, IgG, IgA, and IgM content. In the milk, grazing had a significant effect on IgM, β-carotene, and vitamin E concentrations, but not on IgG and IgA concentrations. Additionally, there were significant positive correlations between IgM and β-carotene concentrations, IgG and IgM concentrations, IgG and IgA concentrations, IgA and IgM concentrations in the milk from grazing cows. These results suggest that pasture intake of dairy cows may increase IgM in the milk and can enhance the immune responses.