

Poultry Nutrition- Modulator of the Immune Response in Both Animals and Consumers

A. Pop^{1}, I. Togoe¹, N. Constantin¹, G. Gajaila¹, E. Balint¹, Faculty of Veterinary Medicine
Bucharest, Splaiul Independentei Street, No. 105, Sect. 5, Bucharest, Romania,
E-mail: aneta_pop@hotmail.com*

Abstract

The researches of our group focused on the investigation of the effects of some lectins introduced in poultry nutrition in order to manipulate their immune response. The used lectins were isolated by the biochemists in the faculty's laboratory, by affinity chromatography, from Wheat Germs, *Solanum tuberosum* buds, and *Cucurbita pepo ovifera*. The lectins were introduced in the drinking water of 15 days old chickens, in farm groups where infectious bursitis was presented. The orally introduced lectins in both vaccinated and non-vaccinated individuals induced lymphocytes proliferation and a reverse of lymphocytes/neutrophiles rate. It could be concluded that all the three lectins survived to proteolysis attack through the digestive tract and they induced an important response on immune cells level. It can be concluded that, by a comprehensive nutrition manipulation, the poultry effectiveness may evaluate better and their products, from meat to eggs should be free of antibiotics and other pharmaceuticals.

Introduction

The previously reported presence of carbohydrates determinants on the immune cells surfaces as well as their importance for inducing a certain mode of action, the lectins activities of some lymphocytes as well as the changes of the glucidic moieties of acute phase proteins and immunoglobulin during the inflammation, cancer or autoimmune diseases suggested the importance of ingested lectins or their interactions with the digestive tract glycoproteins in manipulating the lectin fed animals (Van Damme et al, 1998 , Jordinson et al. 1999, Ahman and Melander, 2003). Despite the fact that most of the lectins were introduced in the antinutrients group, our research started from the fact that for animals most of the feeding stuff is either semi processed or raw, so the lectins presence should be preserved.

Materials and Methods

Animals: 6 groups of 15 chickens of 15 days old vaccinated for infectious bursitis and 6 groups of 15 no vaccinated 15 days old chicken from the same farm.

Lectins: wheat germs from a commercial producer –for human feeding, were administered both in a raw form and as a affinity chromatography purified lectin, 2 groups, one group, with *Solanum tuberosum* buds purified lectins, one with *Cucurbita pepo ovifera* affinity purified lectin, and 1 control group for each vaccinated and no vaccinated groups.

Lectins administration was done for 5 days in the drinking water.

Results and Discussion

All the lectins induced a lymphocytes proliferation in both vaccinated and no vaccinated groups. The no vaccinated groups had a similar survival rate to the vaccinated ones, and a better physiological status. The groups that received lectins presented an increase in neutrophiles percentage compared to the no vaccinated ones. These results demonstrated that the lectins administered, mainly in the raw form of Wheat Germs, survived to the proteolysis attack of the digestive enzymes, were assimilated and more, they induced significant changes in the immune cells population.

The most interesting discussion is that we, all the vertebrates probably, assimilate more than we think, mainly from the protein content of our food. More than this, it may be a possibility to manipulate both our source of meat and our food by introducing such proteolysis digestion

resistant proteins that can not only induce food allergies but also beneficial effects. A philosopher said, many years before, that we are what we eat. It is maybe the time to plead for this idea, because by nutrition we can have a safer, less chemically or pharmaceutically processed food that could be a new way for human nutrition and immunology development too.

References

AHMAN, I., MELANDER, M.(2003), Potato proteins and other plants proteins, as potential transgenic resist factors to pollen beetles in oilseed rape, *Annals of applied Biology*, **Vol.nr. 143**, pages 253-260.

JORDINSON, M., GOODLAD, R.A., BRYNES, A., BLISS, P., GHATEI, M.A., BLOOM, S.R., FITZGERALD, A., GRANT, G., BARDOCZ, S., PUSZTAI, A., PIGNATELLI, M., CALAM, J., (1999), Gastrointestinal responses to a panel of lectins in rats maintained on total parenteral nutrition, *Am J Physiol*, **Vol. nr. 276**, pages 1235-1242.

VAN DAMME, E.J.M., PEUMANS, W.J., PUSZTAI, A., BARDOCZ, S., (1998), *Handbook of Plant Lectins: properties and Biological Applications*, Wiley&Sons Ltd. England.