MINISTRY OF AGRICULTURE, FOOD AND FORESTRY
RISK ASSESSMENT CENTER ON FOOD CHAIN

SCIENTIFIC OPINION

EFFECTS OF DIET FORMULATIONS CONTAINING PLANT OR ANIMAL PROTEINS ON VITAL SIGNS, GROWTH, WELFARE OF BROILERS AND ENVIRONMENT

ABSTRACT:

In recent decades, meat consumption and ever-increasing demand in the market have led to a rapid development and expansion of industrial poultry farming. Against the backdrop of an existing EU ban on the use of a number of animal proteins in poultry feed, there is a clear need to provide alternative sources of plant proteins in poultry feed. For animal proteins, despite being a source of quality protein, there are many restrictions on use - they are a potential source of zoonoses, they are more expensive and pose a greater threat to environment (pollution) due to the higher amounts of nitrogen, phosphorus and ammonia emissions released into the fertilizer when feeding poultry with them.

Regarding the above, it is clear that the production of poultry meat based on plant feed/plant proteins has emerged as an increasingly clear trend in the modern world, also driven by the growing consumer demand for biological, hygienic poultry products fed without animal protein supplement (broilers bred only on vegetable diets are preferred in the European Union and in the Middle East). Mixing of vegetable raw materials, most commonly soybean meal, rape, sunflower and mustard, as a source of protein rather than the incorporation of animal protein into poultry feed, can provide a satisfactory result in the growth, development and viability of the poultry, provided that the diet is balanced with all necessary nutrients like essential amino acids. These feed materials are a good source of food, relatively cheaper, readily available, easy to process, and with lower risk as a source of infection.

It should be borne in mind that plant protein sources contain several anti-nutrients, and also lower quality proteins, have a lower digestibility, and a lower biological value than proteins of animal origin. Complete conversion to a plant diet requires supplementation of amino acids, enzymes, trace elements and vitamins, as well as addition of high energy products to meet the increased needs of the organism of industrially kept poultry.

Concerning environmental protection and efforts to reduce the excretion of nitrogen, phosphorus and ammonia emissions by influencing nutrition, researches have shown that reducing excess raw protein in poultry feed and adding essential amino acids has the potential to increase the biological value of feed and reduce the release of nitrogen, especially through urine. The use of the enzyme phytase (for degradation of phytate in plants and release of digestible inorganic phosphorus from them) leads to the possibility of reducing the amount of used feed additives, added phosphorus and reducing the excretion of phosphorus in the excrements. This is the reason for the marked tendency to substitute animal proteins with plant proteins.

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