



> APPLIED POULTRY NUTRITION

Feedstuff composition, presentation and dietary nutrient content have a great impact on performance of poultry. The effects can differ depending on species, age and production goal. In order to achieve optimal animal performance at the farm, it is of great importance to know the relation between nutrition, animal health and technical performances. Poultry nutritionists need to combine the theoretical knowledge about digestive physiology and biochemistry of feedstuffs to formulate diets. Therefore, the goal of nutrition is to provide essential nutrients to the animal for an efficient production, but also to assure animal welfare and health, and a low excretion of non-digested nutrients to the environment.

1. Learning objectives

- To obtain knowhow to apply theoretical and practical nutritional knowledge to improve poultry performance.
- To obtain knowhow to meet nutritional requirements of poultry, as well as how to face the certain dilemma like efficiency and intestinal health.

Schothorst Feed Research can provide presentations on various topics related to poultry nutrition. A number of these presentations are shown in the list below. Of course, subjects can be added to this list upon request. From the list below you can compose a program for your training. Of course, we are happy to assist you in composing a suitable program for your group.

HALF DAY – FULL DAY MODULES

These modules can be scheduled for half a day up to a complete day. The length of the modules can be adjusted in consultation with the client. The content of these modules will be tailored to the knowledge level and background of the participants.

1. Feedstuffs (multispecies)

Formulating animal feed is a complex task. Many different feedstuffs are available with very different nutritional characteristics. Next to the cost price, nutritional quality and feed safety of feedstuffs need to be considered in formulating animal feed. Unfortunately, many typical characteristics of feedstuffs are not considered in linear programming, so including these factors into a feed formulation greatly depends on the knowledge and skills of the person formulating. This module brings feeding value, feed quality and feed safety together.

2. Feed formulation

Least cost formulation is used by nutritionists to formulate feeds for the lowest costs possible while meeting all nutrient requirements and feedstuff restrictions at the actual market prices of feedstuffs. However, diet optimisation is not that simple. You always need to consider your specific situation. The learning objective of this module is to apply theoretical knowledge into feed formulas for different species and under different circumstances. The participants can hand in topics in advance by sending an e-mail to training@schothorst.nl. It is advised to schedule this module at the end of the training

SHORT MODULES

These modules will take about 1.5 – 2.5 hours. Taking breaks and lunch into account 3 or 4 modules can be scheduled on a day. Of course, also these modules can be tailored to the knowledge level of the participants.

3. Energy evaluation

The basis of energy evaluation in poultry will be explained, including the nitrogen balance correction for the determination of the metabolisable energy (AMEn) content. Prediction of AMEn from digestible nutrient fractions will be discussed with some exercises for the participants showing to what end this can be used.

4. Protein and amino acid evaluation

Amino acids are important in poultry diet formulations, but different digestibility coefficients are used. What is the added value of diet optimization based on digestible amino acids and the ideal amino acid profile, as well as what other factors can affect amino acid digestibility and requirements.

5. Protein sources in poultry nutrition

Soybean meal is the most important protein source in poultry. However, sustainable production and use of non-GMO diets makes that this protein source is topic of discussion. There are several options to reduce the level of soybean meal in poultry diets. This can be done with currently available protein sources, but there is also a lot of research and discussion on “new” protein sources.

6. Low protein diets

The current high price of virtually all protein-rich feedstuffs, in combination with the high dependency of soybean meal imports in the EU, has increased the demand for alternative protein sources in poultry feeds. Legislative changes are aiming to stimulate “circular economy” in the EU by lifting the ban on the use of processed animal proteins (PAPs) of swine, poultry, and insect origin. Moreover, the production of alternative (vegetable) protein-rich ingredients and their by-products is promoted. Many questions about governmental regulations, economics and potential application of alternative vegetable and animal protein sources on animal feeds are raised by the feed industry at this moment.

7. Calcium and phosphorus evaluation

Backgrounds of the different phosphorus systems will be explained, and effects of dietary calcium on the utilization of phosphorus. In this presentation also the efficacy of phytase and the difference between different phytase products will be dealt with.

8. Physiology (45 minutes)

A brief introduction to the physiology of the gastrointestinal tract and its development with age to understand nutrient digestion, absorption, and intestinal health.

9. Intestinal health of poultry

The gastrointestinal tract is a carefully balanced ecosystem, which is subject to nutritional and microbial challenges. The intestinal immune system, the most common intestinal commensals and pathogens in poultry, and nutritional factors affecting intestinal health will be discussed.

10. Feed processing

Producing feed is more than making a diet that contains all the required nutrients. Feed processing can help to improve the availability of nutrients to improve feed efficiency. However, the effect of feed processing is feedstuff dependent. Furthermore, feed processing technologies can positively affect intestinal health. However, technologies that improve either intestinal health or feed efficiency, like particle size distribution, are generally counteracting. Therefore, what conflicts are we facing when using processing technologies?

11. Meat quality

Deviations in the breast fillet is one of the main reasons for the rejection of broiler chickens in the slaughterhouse. On which aspects are the broilers assessed and how can we respond to them with feed.

12. Laying hen nutrition: Egg formation and egg quality

An important issue in layer production is the reducing egg quality with aging of birds. This is not only related to nutrition, but with nutrition you might be able to support the egg shell quality. Egg formation, deviations in egg formation, and nutrients that can affect egg (shell) quality will be discussed.

13. Broiler breeder nutrition

A broiler breeder bears the genetics of a broiler (high growth rate), while it needs to produce hatching eggs with vital broiler chicks. Nutrition will affect the breeder but also the broiler chick. All these factors make broiler breeder nutrition very complicated. In this presentation these challenges will be discussed, especially the effect of protein and energy levels.

14. Early feeding

There is a considerable interest in feeding of young broilers from the perspective of minimizing early mortality and getting a flock off to a uniform start. There are several hatching systems that support the provision of feed immediately after hatching. Nutritional approaches that support the physiological condition of the hatchling will be discussed, as well as the effects on early growth and mortality.

15. Precision feeding

Poultry nutrition aims to meet nutrient requirements of animals as accurately as possible. These requirements are affected by given conditions and specific production goals. As a nutritionist you are challenged to deal with the variation in requirements caused by many different factors. Precision feeding is the practice that helps you to make this variation insightful and helps you to deal with it.

16. European Chicken Commitment (ECC)

Many animal welfare organisations and over 200 companies worldwide undersigned the European Chicken Commitment (ECC), also known as the Better Chicken Commitment, which will take effect no later than 2026. What does this mean for future broiler farming? Is it a possibility or a threat? What are the implications for your (clients) farming system? Are your current broiler recipes sufficient for birds raised according to the ECC principles?

17. Mycotoxins (multispecies)

The increased levels and variety of mycotoxins in feedstuffs and consequently in feeds pose unpredictable feed safety problems worldwide. In brief, these substances affect the gastrointestinal tract in a negative sense. Most of all know what are mycotoxins, where they occur, and their main effects in different animal species, especially when acute contamination is considered. However, prevention and remediation of mycotoxins remain a challenge under subclinical and asymptomatic circumstances, where economic losses cannot be always avoided. Furthermore, climate change cannot be neglected and play an important role in mycotoxin contamination in commodities. And last, but not least, the interaction of mycotoxins with other mycotoxins, with veterinary drugs, parasites, host-microbiome, as well as with feedstuff components must be in mind when evaluating risks.

18. Heat stress and nutrition

Animals facing heat stress reduce production performance because animals try to prevent heat production caused by the syntheses of muscle and egg. Nutrients will be used for the immune system rather than for production. There are several nutritional and feeding strategies that can be applied to minimize the negative effects of heat stress. These strategies will be addressed in this presentation.

19. Minerals

Focus on the optimum levels of sodium, potassium and chlorine in broiler diets will be given. The effect of different sources of sodium as well as the effect of dietary electrolytic balance in broiler diets will be addressed.

20. Facts about fats (multispecies)

Fats and oils are more than just an energy source for animal feeds. The fatty acids as part of triglycerides or in fatty acid products differ in chemical composition and physical characteristics. Some fatty acids can be considered functional nutrients. The main use of fats and oils in the feed industry is to increase the energy content of the feed. Therefore knowledge about the digestibility of fat, metabolisable energy content and utilisation for different production goals is of importance.

21. Duck and turkey nutrition

Turkeys and ducks are (like broilers) growing animals. However they are physiological not the same as broilers. In this presentation the differences of turkey and ducks compared with broilers will be explained.

22. Effects of early life conditions on immunity in broilers and layers

Adequate microbial colonization during the neonatal period is essential for the development of the immune system. Delayed access to feed post hatch (as is often the case in practice) leads to a delay in colonization. Disturbance of the microflora composition at a young age can have long lasting consequences for immune development and therefore disease resistance at a later age. Which factors can disrupt microbial colonization, how does genetics (broiler chicken vs laying hen) play a role in this?