Session Cross-cutting: April 13th 09.00 hrs

5s4a: : Waste reduction and novel resources for sustainable production of safe food or feed

Improving protein sovereignty in poultry: how novel & local feed-grade amino acids can facilitate the utilization of European plant-based protein

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Poultry production is an important contributor to global warming potential (GWP), acidification (AC) and eutrophication (EU). This is mainly due to 1) the use of high dietary crude protein (CP) levels and 2) the important demand for imported protein feedstuffs like soybean meal (SBM). Indeed, 51% of SBM used in Europe is dedicated to poultry production and 70% is originating from South America (DG Agri – Oilseed and Protein Crops Production, 2019).

To reduce the utilization of SBM, novel feed-grade amino acids (AA) solutions like L-Arginine and L-Isoleucine, together with current portfolio of commercially available L-AA, can further support the poultry industry via:

1-Reducing the level of dietary CP with a gradual replacement of SBM by local cereals and local L-AA. According to Le Cour Grandmaison et al., (2020), this strategy does not impact performance and reduces SBM inclusion by 35kg/T of feed for 1% point of CP reduction ($P<0.05$). It also leads to significant improvement of GWP (-226 kg CO_2eq per ton of broiler live weight), AC and EU via significant reduction in nitrogen excretion and ammonia volatilization (-11% and -20% respectively; $P<0.05$).

2-Substituting SBM with other plant-based proteins like sunflower (SFM), rapeseed (RSM) and corn gluten meals (CGM). In a recent trial, broilers fed an all-European based diet with SFM, RSM, French-SBM, lupin achieved similar performance to broilers receiving a diet with imported SBM (Pampouille et al., 2021). As alternative raw materials such as SFM and RSM are more imbalanced in AA profile than SBM, the use of novel feed-grade AA allows to further adjust the diets and meet broiler AA requirements.

3-Combining the two strategies to feed SBM-free diets to broilers. Three recent broiler trials have achieved a full replacement of SBM using various protein sources: potato protein concentrate, faba bean, RSM, SFM, CGM and novel L-AA. No negative effects on growth performance were detected based on Willems et al., 2020, Méda et al., 2019 and Amerah et al., 2021 and environmental performance (GWP, AU, EU) was clearly improved.

In conclusion, novel & local AA are today important elements to consider when tackling European protein sovereignty as they allow to reduce the demand for imported protein-rich feedstuffs (such as SBM). This nutritional strategy has clear positive effects on sustainability (GWP, AC and EU at farm gate). The origin of AA is also to consider, as the AA sourcing strategy impacts the level of benefits on GWP of meat.

Keywords: Poultry, Amino acids, Sovereignty, Protein