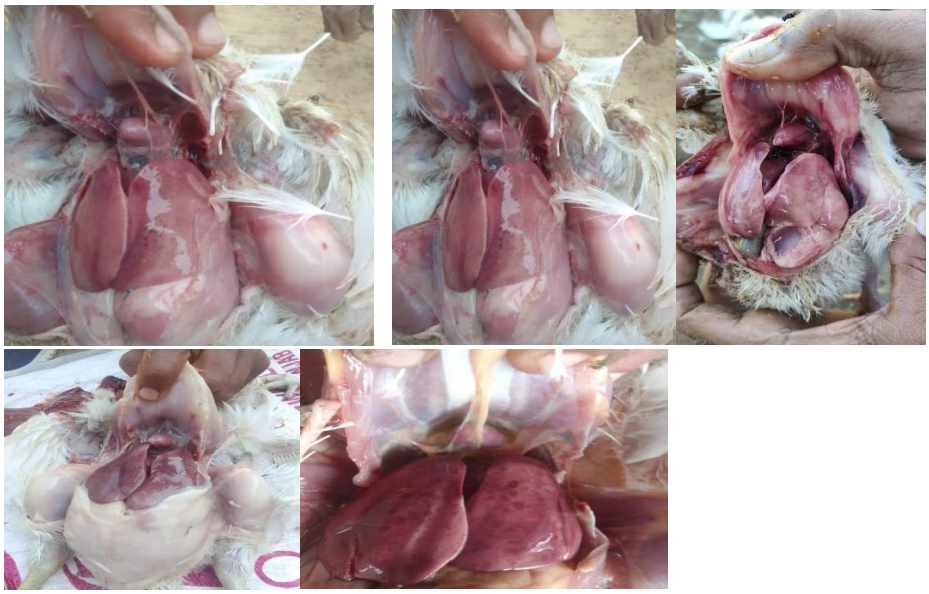
Change of Raw Materials & current challenges in Poultry

Low price or lifting rate of broiler chicks & broiler meat from farm feed formulation force to change with alternative raw materials which early also practise in industry but it was restricted to 0.5 to 1 % which normally not affect macro & micronutrients , since feed formulation is not only to balancing of macronutrients micronutrients mathematically on paper but also their biological corelation , If one increase how it affect other nutrients in absorption rate or cause deficiency of other nutrients

Some of the clinical observation in field which has been observed & how it is misunderstood with IBH which after lab test it has been confirmed that it is not IBH corrected by macro & micronutrients

1. Liver enlargement Discolouration



2. Swollen Kidney condition

3. Loose or lammed bird's mortality

Photo Courtesy: Dr Vikas Jyane (Field Visit)

Rate of carbohydrates absorption differ in grain & millets interesting possibility is that slowly digestible starch may be sparing amino acids from catabolism in the gut mucosa (Enting et al., 2005). glucose and amino acids, especially glutamate and glutamine, are catabolised in avian enterocytes for energy provision (Watford et al., 1979). If this proposition is valid,

energy would be more efficiently derived from glucose (Fleming et al., 1997) and post-enteral availability of amino acids would be enhanced. Diets formulated based on pre-determined starch and protein digestion rates; Liu et al. (2020) found that broiler diets with a **starch-to-protein digestion rate ratio of 1.66 generated the optimal FCR of 1.450 from 7 to 35 day post–hatch**. Nevertheless, if practical nutritionists are to harness digestive dynamics into their formulation of broiler diets, starch and protein digestion rates of relevant feedstuffs need to be established.

So while formulating feed formulation inclusion of alternative grain or millets as a energy source following point need to remember for balancing of rapidly starch & protein ratio

Choice of grain in feed define based on rapidly & slowly digestible starch relatively

a. Wheat starch digestion rate 0.117/minute more rapidly than maize & it contains 29.5 % rapidly digestible starch.
b. Maize starch digestion rate 0.087/minute & it contains 20.9% rapidly starch
c. Sorghum/ Bajra starch digested 0.075/minute & it contains 16.2% rapidly digestible starch.
d. Parboiled rice has (30%) less rapidly digestible starch then white Rice (50-60%)

Case I Layer :

Recently one of the layer farmers complaining about fatty layer in his layer farm & he has try all kind of additive which work on fatty liver since in his formulation (feed formulation himself based on breed standard manual) carbohydrates energy parts come from Bajra (Peral millet) & white Rice which disturbing

rapidly starch & protein ratio which he is not paying attention this is typical case of macro nutrients **imbalancing**

In same climatic region where farm is more closed & 1 decade older but by careful balancing of macro nutrients & micronutrients, feed cost is cheaper by 1 to 2 INR per kg & more uniformity in farms birds in terms of body weight , production, less clinical challenge in birds .

Case II Broiler: Mortality in Broiler birds 12 to 30 % some farm or integration case even more which normally expectation is in between 3 to 5 % mortality. In some area viral outbreak, vaccine failure is more came to notice along with that secondary multiple complication in broiler birds we observed .It was so much confusion by looking at symptoms in field because of imbalance macro nutrients , inadequate micro nutrients which cause loose or lammed birds enlarge discolour liver & swollen kidney .

In Same climatic zone when care of macronutrients & addition of micronutrients more than conventional feed formulation requirements adequately incorporates in feed along with good toxin binder (adsorption stable in **between pH 2.5 to 8 pH**) or farm level application not only mortality reduces to 3 to 5 % but also in terms of growth FCR 1.4 & 1.45 achieved .

slight disturbance in ratio affect gut, liver, kidney health in birds also It has been well established that feeds with low levels of lipotropic factors, such as choline, methionine, and vitamin B12, biotin can result in fat infiltration of the liver & swollen kidney syndrome , currently this micronutrients problem more in case of grain change without proper balancing in feed also second most important things is fungal toxin which is day by

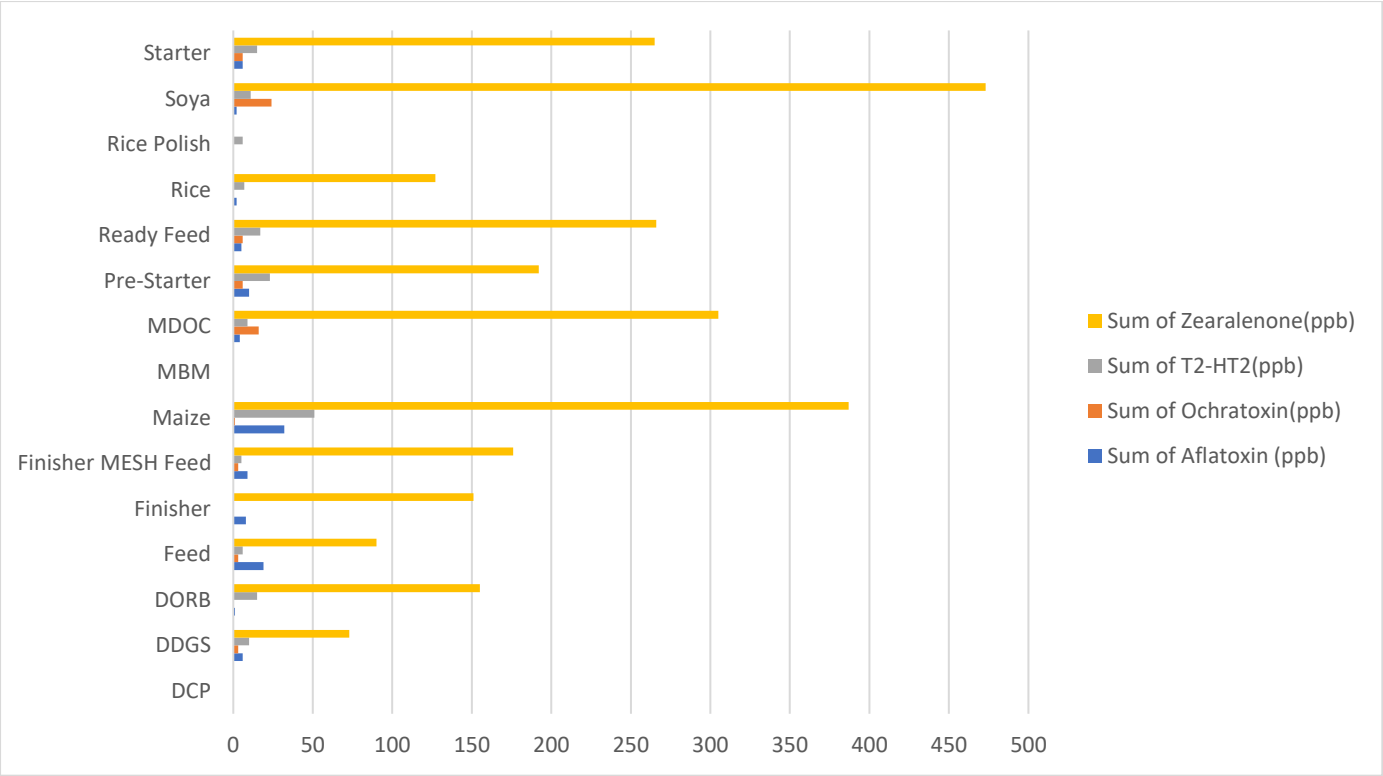
day more problematic due to global warming problem in toxin management

a. Lack of awareness about raw materials quality most of raw materials still purchase base on protein & moisture % other parameters not consider.
b. Some of feed millers & farmers which have awareness of fungal toxicity mostly go for aflatoxin due to lack facility of testing of other fungal toxin also cost of testing on paper by looking at first it seem costly but if we check birds health & farm production or growth point of view it is much cheaper then clinical cost .

Presence of fungal toxin in feed always affect birds in combined form which not only cause lack of absorption micronutrients but also cause corelated effects of clinical health on birds such as enlarge discolour liver & swollen kidney In line with that, recent epidemiological data indicate high correlation between outbreaks of Newcastle disease and AF contamination of broiler rations (Yunus et al., 2011). Feeding broiler chickens 0.3 mg AF/kg of feed significantly reduced antibody titres against Newcastle disease and infectious bursal disease (review in Girish and Smith, 2008). Antibodies are produced by B-lymphocytes, which are programmed in the bursa of Fabricius. The reduced antibody concentration observed in poultry fed AF-contaminated diet is most likely related to lymphoid depletion and inhibition of development and functional maturation of the bursa of Fabricius, at doses as low as 0.1 mg AF/kg of feed. Ducks and broilers fed with concentrations of DON, Zearalenone (same source fungus) ranging from 0.3 to 1.2 mg/kg diet also had decreased antibody titers to common vaccines (Newcastle disease, infectious bronchitis) and a reduction in the mass of the bursa of Fabricius (Awad et al., 2013). For Zearalenone, DON and AF, the effects seen in the bursa of Fabricius, and the subsequent impact on

antibody, might be a direct consequence of the inhibition of protein biosynthesis.

Past 5 months observation in field about fungal toxin



Conclusion:

a. Balancing of macro & micronutrients in feed formulation while incorporating non-conventional raw materials.
b. Due to Global warming challenge of fungal toxin more problematic need to focus on it .
c. For reference to do feed formulation breed manual is okay but to avoid multiple complication its nutrients need to formulate based on region climatic condition in commercial feed & farm specific in integration feed.

Best Regards

Dr Bhaskar Choudhary (Animal Nutritionist) 🙏