Summary of the Broiler Breeder Workshop held on 24 May 2018 @ Klein Kaap Boutique Hotel

Interesting information shared by international guest speakers, Dr Leonardo Linares, Dr Paul Tillman, Dr Niccki Scriperm and Dr Peter Plumstead

Trace Mineral Nutrition in Broiler Breeders- Dr Leonardo Linares

Eggs contain macro and micro minerals at different concentrations in the yolk and albumin. The hatching egg consumes minerals from the yolk during incubation. During the last days of incubation, yolk mineral levels are low, and accordingly consumption of those minerals by the pre-hatch chick is low. Embryo mortalities are highly correlated to vitamin and mineral deficiencies during different stages of incubation.
A 1 cm of chick length advantage at day of hatch can result in 264 grams more bodyweight, with 45 grams more breast meat yield at 38 days of age, hence the importance of yolk absorption.
Egg shell colour influences hatchability; pale eggs have a lower hatchability.
Availa minerals improve shell membrane, quality and darkens the colour.
Availa Fe fed to broiler breeders improves breeder hatchability and fertility as well as broiler weight.
Broiler FCR is improved with added Fe fed to Breeders.
Egg Se concentration can be influenced with dietary Se source and levels; increased egg Se levels improves: oxidation status, epithelial tissue integrity, egg quality, reproduction, immune function and feathering.
Availa Cr maintains performance in heat stress situations.
Recommended Availa mineral levels for broiler breeders:

- 40 ppm Zn AA + 40 to 70 ppm from Inorganic source
- 40 ppm Mn AA + 60 to 80 ppm from Inorganic source
- 7 ppm Cu AA + 7 to 10 ppm from Inorganic source
- 40 ppm Fe AA as Total replacement
- 0.2 ppm Se AA + 0.2 ppm from Inorganic source
- 0.6 ppm Cr AA as Total

Broiler Breeder Performance Considerations- Dr Paul Tillman

Broiler weights are highly correlated to broiler breeders. For breeder uniformity and performance weight should be controlled, without causing boredom-> feather licking-> cannibalism. Proper record keeping of BW and CV is important for uniformity.
CV goal<10%
Uniformity is affected by (Leeson & Summers):

- Correct feed distribution
- Correct feeder space
- Feed segregation
- Inadequate water access
- Disease challenges esp. coccidiosis, worms
- Too large flock size (small pens)
- Effective environmental control throughout the house
- Brooding practices

4 Week grading can improve uniformity. Management of birds, environment, equipment and feed is key to breeder performance. The nutritionist role = Match nutrient supply to nutrient requirement. Breeder management guides supplied by the different breeder companies contains valuable management information:

- Preparation for chick arrival
- Chick performance measurements/ early life management (crop fill)
- Water management (supplemental drinkers reduced 7-day morts)
- Feeder space
- Feeding time (feed distribution <3 min)
- Bird density

Weight gain is a direct reflection of feed intake & nutrient density-> match feed intake to nutrient requirements of the flock.
How we feed is more important than **what** we feed.
There is no single requirement for energy or amino acids (determined by temp, growth, egg mass)
Monitor feed intake & density:

- Fat scoring/ breast scoring = body reserves (males & females)
- Feather uniformity
- Broiler breeder hens divert excess nutrients into liver lipids, excess follicles, growth
- Dietary energy and protein levels influences breeder performance
- Feed changes should be done gradually ->disturbs bird metabolism
- Different models are available to determine energy requirement
- Amino acid requirements -> Digestible Lys and Sulphur amino acids

Focus on uniformity during rearing and fertile eggs that hatch during lay.

How to determine if trial results will transfer to the production system? - Dr Nickki Sriperm Tillman

Was the trial done correctly?

- Relevant factors
- Design
- Accuracy vs precision

Methods to increase accuracy & precision:

- More replications
- Precise measurement
- Minimize uncontrollable/unknown factors by randomisation
- Minimize moderate controllable factors by blocking
- Minimize controllable/ known factors by Analyses of Covariance

Choose the correct/applicable experimental design for accurate results (e.g. CRD, RCBD, Latin square design, Factorial design, Split plot, Split-split plot, repeated measures). Blocking reduces error variance and can detect treatment differences.
No significance between treatments:

- Not adequate number of birds per pen
- Not enough replications of treatments
- Influenced by extraneous variables

Plan a field trial for success:

- Known farm variation- Blank diet testing
- Pick median performance farms for the trial
- Closest performance to each other or use blocking
- Collect data over time/do replicates
- Apply treatments on the same farm over time-> on-off test diet
- Higher variation between farms requires more reps

A good experimental design provides the true result of a tested product, reduces variability within treatment conditions and detect differences among treatments.
Using average values might not be enough when testing products in the field-> must consider confounding variables that influence the outcome.

Understanding Limestone Quality and Ca Digestibility in Poultry Feed- Dr Peter Plumstead

Limestone: the single largest contributor of dietary Ca in poultry diets.
Required for good bone and eggshell formation.
Digestibility of limestone Ca & how to characterize the differences in quality are unknown.
Chemuniquè, the University of Maryland (USA) & the University of Pretoria have launched a project to address these uncertainties.
Research by the University of Maryland (USA) confirmed:
Differences exist in Ca digestibility from different limestone sources.
The type of limestone used in feed can affect P digestibility in broilers.
SA Geological differences in limestone rock -> amount of digestible Ca from SA Limestone -> effect of the limestone on P availability in the feed-> affects phytase enzymes.
Up to date progress of the project:

- Physical characterization of the limestone
- Completed the first limestone ileal digestibility trial with great success!!

A new limestone quality quantification service is provided by Chemuniquè.
Many local and international samples have been processed-> confirmed significant differences.
Next step of the project: quantify the effect of these differences on digestibility of Ca.
Chemuniquè assists producers/ feed millers with:

- how to evaluate limestone quality
- information on Ca, P and bone mineralization