

Research Priorities
November 18, 2021

Ammonia and *Salmonella* Enteritidis (SE) reduction have been designated as top priorities by the CHEP Research Committee.

1. Production-based Research

- a. Methods to increase fertility and number of saleable chicks
- Differences in fertility and paid hatch
 - When is it most beneficial to add spiking roosters?
 - Research on new and emerging technology to assess on-farm, real-time fertility

2. Breeder Welfare

- a. Ammonia control
- Developing more accurate methods to measure ammonia on-farm, and validating existing ammonia measurement equipment (such as the ammonia meters used by auditors)
 - Establishing baseline ammonia levels on the farm, and once a consistent methodology is established, have CHEP compile national data to inform decisions going forward
 - Validating benchmarks (such as those referenced in the code, or those determined as a result of on-farm baseline data), including the study of the impacts of different levels of ammonia concentration on the health and well-being of birds and humans in order to determine appropriate level(s) of ammonia to include in the animal care program as maximum thresholds depending on climate and temperature
 - Cost-effective methods to control ammonia
- b. Density
- c. Euthanasia
- Methods for birds >3kg, including low atmospheric pressure stunning (LAPS)
 - Is LAPS practical for on farm application?
 - Efficient and quick way to euthanize breeder flocks in an emergency situation
- d. Aggression
- Feed energy and male aggression
 - Research linking specific genetic traits with male to female aggression
- e. Early mortality of breeder hens (*E. coli*, staphylococci)
- *E. coli* and staphylococci more likely to post peak mortality association
- f. Physical alterations
- Toe-trimming, beak trimming: ideal methods and timing for procedures

- Cost-effective, practical management practices that can eliminate physical alterations
- g. Transporting newly hatched chicks
 - Length of time that newly hatched chicks are sustained by the yolk sac
 - Effectiveness of hydration/nutrient products used prior to and during transit
- h. Effects of vaccination programs on breeder welfare
 - Current status
 - Maximum thresholds – how much is too much?

3. Environmental Research

- a. Effects of temperature control on egg handling and holding, and egg transfer vehicles, including egg sweating and links to rots after eggs leave the farm.
- b. Effects of lighting on broiler breeder production, fertility, and bird health
 - LED lighting long-term
 - Light intensity, spectrum, colour temperature (K)
- c. Environmental impact and effects of climate change as related to broiler hatching egg production

4. Poultry Health and Disease

- a. Variant bronchitis-impact on breeder production and fertility
- b. White chick syndrome
- c. More efficient vaccination programs
- d. Effect of probiotics
- e. *Mycoplasma synoviae*

5. Alternatives to antimicrobials

6. Control of Foodborne Pathogens/SE

- a. Control of *Salmonella* by vaccination (methods and effectiveness)
 - Newer *Salmonella* vaccinations or supplemental adjuvants to improve vaccine efficacy
- b. Sources of infection
 - What is transferred to the chick? How does egg incubation affect *Salmonella* cells?
- c. Possible barn differences, what type of construction, material, insulation, volume of air, angle to the sun (infrared radiation)
- d. Prevalence
- e. Population density
- f. Control of *Campylobacter jejuni*
- g. On-farm strategies to reduce and prevent *Salmonella* while birds are in production
 - Reduce/prevent *Salmonella* via competitive exclusion (probiotics and antagonistic bacterial species for controlling foodborne pathogens)