Sum up of 6 topics of the 51st IFRG meeting

- *In ovo sexing: from ethical imperative to practical implementation (Matthias Corion, KU Leuven, Belgium)*

Current technologies developed in recent years for *in ovo* sexing were described in the article of Corion et al., 2023. A review of the literature has revealed that interest in this topic remains strong, with China and Germany as mains actor of publication. Moreover, new studies were published on the topic of nociception to better define a threshold for *in ovo* sexing (Kollmansperger et al., 2023; Petrik & Petrik, 2026).

Corion, M., Santos, S., De Ketelaere, B. *et al.* Trends in in ovo sexing technologies: insights and interpretation from papers and patents. *J Animal Sci Biotechnol* **14**, 102 (2023). https://doi.org/10.1186/s40104-023-00898-1

Petrik, M. T., & Petrik, J. J. (2026). Onset of nociception and pain perception in chicken embryos – a review. *World's Poultry Science Journal*, *82*(3), 849–858. https://doi.org/10.1080/00439339.2026.2643678

- *Effects of early feeding on pectoralis major muscle development in broiler chicks (Henrique Carneiro Lobato, Federal University of Minas Gerais, Brazil)*

Providing feed and water at early stage of life, in the hatcher combined or not with at the beginning of rearing period, significantly enhanced early *Pectoralis major* development (increase of myocytes area, perimeter, and diameter). Interestingly, a single feeding at the beginning of rearing period (fasting in the hatcher) did not further promote muscle growth compared to not feed during the first 48h.

- *Transcriptomics reveals metabolic responses of broiler embryos from short- and long-stored eggs to 10 hours of pre-incubation warming (Anne Pennings, Wageningen University & Research, the Netherlands)*

Pre-warming could be a useful tool to improve hatchability after a long storage (> 7 days), but biomolecular impacts were not yet studied in the embryo. Pre-warming period was subdivided into two period of temperature increase, and transcriptomic analysis too. For the first period (5h to increase form 17.7°C to 29.4°C), gene expressions for long-storage embryos (14 days of storage + pre-warming) and for short-storage embryos (4 days of storage + pre-warming) were involved in cell activity. For the second period (5h to increase from 29.4°C to 37.8°C), gene expressions for both treatments enhanced the activation of DNA replication and the cellular progression. Differential gene expressions underlined negative impacts of the long-storage period, even with the pre-warming period, with metabolic pathways involved in cellular stress, apoptosis, and metabolic and cellular homeostasis.

- *Breaking the shell: How light shapes brain gene networks controlling chick hatching (Louisa Kosin, The University of Edinburg, UK)*

Light during incubation was a critical parameter of embryogenesis, with strong metabolic impacts depending on wavelength (white, blue, green, or red). Moreover, pineal gland and the whole brain were involved in differential metabolic pathways and were associated to differential wavelength of light. The study will go further by adding darkness to the factors.

- *Role of incubation temperature on skin development and footpad dermatitis (Edgar O. Oviedo-Rondon,North Carolina State University, USA)*

A lower incubation temperature (36.9°C vs 37.7°C) significantly limited the development of papillae and the thickness of *stratus corneum* (the outer layer of footpad) at hatch. These results also involved a higher incidence of footpad dermatitis during the rearing period. Higher incubation temperature (39.7°C vs 37.7°C) presented the same footpad development as standard condition.

- *Mitochondria function in different muscles of chicks treated with higher and lower temperatures during incubation (Ina Starke)*

Mitochondria respiratory activity differed according to the muscle (*Musculus pectoralis* or *gastrocnemius*), but not according to the sex or the incubation temperature in this first study. The increase was +1°C from the incubation day 10 to incubation day 13, and it could be interesting to go further on this parameter. Strong thermal manipulation significantly impacts muscle metabolism, and could include mitochondrial activity.