

Incubation Fertility Research Group (IFRG-WPSA working group 6) Report

Meeting 2016 , Brugge, Belgium. 04/12-06/12/2016

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The 2016 meeting of the IFRG-WPSA working group 6 was organized in Brugge, a historical city located in the north-east of Belgium. Despite the exceptional time close to December festivities 44 participants joined the conference in Hotel de'Medici located at the Potterei central Brugge. Remarkably this year registrations were slow, probably because of the World Poultry Congress in Beijing in September. By the end of October only 16 delegates had registered. Nevertheless, with a little bit of patience we were able to offer an interesting program, not the least because we received many presentations and posters from PhD students and researchers from INRA France.

The program concentrated on 3 major topics/themes relevant to fundamental as well as applied fertility and incubation research: (1) nutrition of embryo and hatchling, (2) conservation of endangered species and (3) fertilization physiology .

The first session focused on *Nutrition of the embryo and hatchling* during the first days after hatch. Prof Zehava Uni from Hebrew University opened this session presenting an overview of the changing metabolic needs of the developing embryo and orchestrated transport of nutrients from albumen and yolk and extra-embryonic membranes. Limitations of minerals during critical hatching period might induce a mineral deficiency during the last days of incubation. Prof Uni was sponsored by incubator manufacturers HatchTech, Petersime and Pas Reform.

The second speaker dr. Henri Woelders from Wageningen University, focused on the relation between early microbial colonization of intestine and gut immunological functions. Later in this session Mylène Da Silva, from the Department of Reproduction Physiology, INRA Nouzilly, discussed the development and biological functions of amniotic protein profiles as shown by SDS-PAGE electrophoresis. For example, in the second week of incubation amniotic fluid develops proteolytic and antibacterial activities.

The more applied topics related to 'early feeding' were discussed by three speakers. Okan Elibol from Ankara University and sponsored by Aviagen, showed the results of a very detailed study on early feeding of hatched chicks. In this study a clear definition of the moment of access to feed after hatching was used: chicks that had some wet down were recorded as just hatched. It was concluded that post-hatch holding for up to 40 h after hatching had no major detrimental effects on final live performance.

Dr. Hilke Willemsen, Aviagen UK, and Dr. Inge Reijrink, HatchTech both compared the vitality ('quality') of chicks hatched in an environment where feed and water are available immediately after hatching. Dr. Inge Reijrink clearly showed that chicks hatched in the traditional hatcher showed more signs of dehydration compared to chicks hatched in the HatchCare system. Dr. Hilke Willemsen focused on the behaviour of chicks hatched in the

broiler house. A higher % of chicks hatched in the broiler house were resting compared to chicks hatched in a traditional hatcher. The behavioural differences disappeared after day 6. The last speaker of this session Seline Schallier, University of Leuven, discussed transgenerational effects of protein undernutrition of breeders on egg weights. Low protein feed in (grand)parent generations reduced egg weights in the F2 generation, even if F2 hens were fed a standard control diet.

For the second session *Preservation of endangered species* two speakers were invited. Dr. Elisabeth Blesbois, Reproductive Physiology and Behaviours, INRA Tours, showed promising progress in cryopreservation techniques of primordial germ cells and semen. For the latter new methods of semen phenotyping have been developed such that the resistance to cryopreservation of semen can be predicted. Dr. Patricia Brekke, Institute of Zoology, London presented data on hatching failure in the endangered New Zealand bird hihi (*Notiomystis cincta*). Hatching failure is higher in threatened birds compared to other bird populations. The hihi is shown to be a good example as low levels of fertility and higher embryonic mortality were shown in the endangered small hihi population.

The third session *Sperm, fertilization and embryo physiology*, was completely reserved for oral and poster presentations by researchers and PhD students from INRA Tours, Nouzilly. The results of research presented in this session illustrated the power of large groups of scientists collaborating in multi-disciplinary research projects.

Sarah-Anne David showed how cyclic increases of incubation temperature and relative humidity from E7 to E16 increased the thermotolerance of chickens. The cyclic changes in incubation environment is associated with altered metabolic activity and expression of genes up to slaughter age. In the context of this presentation a poster was presented showing adaptive capacities of broiler chickens after incubation climate changes.

Dr. Nadine Gérard, INRA Tours, Nouzilly presented a detailed overview on the relationship between fertility and uterine fluid composition in sperm storage tubuli. Related to this theme a total of 5 posters by PhD students were presented. Electron microscopical techniques, immune-cytochemical methods, biostatistics and molecular functional analysis were used to reveal uterine proteins involved in sperm survival in the hen oviduct.

The last 2 oral presentations were sponsored by Aviagen: firstly Tolga Erkus showed the positive effects of egg storage at 15 °C and one SPIDES treatment at 5 days after storage. Finally Dr. Dinah Nicholson closed the session by reviewing the history of poultry breeding and artificial incubation. For the future dr. Nicholson sees a formalin free hatchery with hatching practice in the farm houses.

Two more interesting posters were received respectively: a detailed description of embryonic development of domestic guinea fowl was presented (M. Marzoni, University of Pisa) and the poster presented by Marine Dewez (Hybrid Turkeys) demonstrated that the CTscan is a good tool for predicting body composition in reproductive hens.