Genetic resistance to gut pathogens

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Pathogenic agents present in poultry guts are responsible for avian diseases but also, especially for Salmonella and Campylobacter, human toxii-infections. Many prophylactic means have been investigated to control their incidence, among which genetic resistance.

Selecting for improved resistance appears to be efficient. Its major drawback was, until now, to require experimental inoculations and long and expensive measures. However, marker-assisted selection and even more genomic selection should make it possible to directly choose the future breeders on their genotypes, with a dramatic (but not total) reduction in the need of artificial infections. Indeed, many results on genomics of resistance were obtained in the past 10 years. Several genome regions controlling resistance-related traits were identified while the role of candidate genes was suggested. However, many questions still remain to be investigated. First of all, resistance has to be very precisely defined as genes controlling it seem to be very dependent on the resistance-related trait. Second, strategy for practical application is still questionable: genetic relations between resistance traits are complex and genetic ability of animals interact with many other factors. Modelling of the whole process, leading from fowl contamination to transmission to other animals or humans will allow an integrated approach of the whole system of rearing.

The presentation will give some indications on all these topics, focusing on resistance to Salmonella, which has been more studied than resistance to other gut pathogenic agents.