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### **Breeding for disease resistance**

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In the context of intensification and specialization of poultry production, next to welfare regulation on animal breeding, animal health issues are of increasing importance to the breeding sector because of the huge related production losses. But animal health and welfare issues are also of importance to the consumers because of potential effects on their own health and their lifestyle choices. Most effective disease control strategies should be developed in an integrated animal health management approach, including prevention, cure, environment control and breeding for disease resistance. Until recently, selective breeding approaches have been applied successfully by poultry breeders to enhance production and reproduction traits; but the inclusion of animal health related traits are scarcely considered because of a clear lack of easy measurable and relevant phenotypes and associated genetic markers which could be integrated in running breeding programs. Though, there have been numerous studies in the past showing evidence of genetic variability of responses to various diseases of economic interest, like parasitic, bacterial or viral diseases. New opportunities have been arising thanks to major advances in animal genomics and related technologies. Most research strategies are now developed, combining structural, population and functional genomics approaches. The objectives are the identification of genes, gene products and regulatory networks involved in host pathogen interactions which could be used in selection and a better understanding of their functions and the underlying mechanisms. Also, there is a growing interest in deciphering genetic parameters underlying the immune response (innate and adaptive) of chickens and how this can be applied to breeding in combination with vaccination. Thus, research and development aiming at understanding and implementing host genetic variation in disease resistance require large use of field data, collaborative multidisciplinary programs and can only be hopefully applied if efficient technology transfer between research and industry is occurring.