

Endocrine Physiology of Reproduction in the Female Chicken: Old Wine in New Bottles

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Abstract

The reproductive cycle of the hen, characterized by well-ordered ovulation and oviposition cycles and by a strict hierarchical growth of follicles, is a suitable model for the study of folliculogenesis. Under the impact of recent developments in mammalian reproductive endocrinology, emphasis has been put on the role of growth factors in folliculogenesis and steroidogenesis during the last decade. The state of the art will be reviewed here. Moreover, new findings concerning different pathways of steroidogenesis as well as regulation at the hypothalamic/pituitary level are considered. The overall scheme of endocrine physiology of reproduction in the hen may however be subject to variation due to environmental or selection effects. The extreme divergent selection in poultry, for growth on the one hand and for reproductive performance on the other hand, makes the broiler breeder an excellent model for studying the interaction between feed and reproduction. The endocrinological background of this interaction will be reviewed as far as our knowledge reaches in this field. Undoubtedly, much will remain speculative and will await further elucidation. Similarly, strain differences in reproductive performance have been demonstrated between female broiler breeder chickens which were divergently selected for different growth or efficiency characteristics. Only rather recently were the repercussions of this divergent selection for growth characteristics on reproductive endocrinology considered, and the importance of growth factors as a component in the control mechanisms of follicular development in

broiler breeder hens was revealed. Since these factors may have been inadvertently altered by selection for growth, and because of their pleiotropic activity (also in reproductive endocrinology) they may lie at the base of correlated responses in reproduction that occur with continued selection for growth and food efficiency in broiler breeds.