results, it is concluded that production of progesterone and 20α-dihydroprogesterone at the luteal phase would be enhanced not only by an increase in the activities of 5ene-3β-hydroxysteroid dehydrogenase and 20α-hydroxysteroid dehydrogenase, but also by a decrease in the enzyme activities related to C_{19} steroid formation from progesterone.

40. Testosterone production by testicular tissue of the camel (*Camelus dromedarius*) during the breeding season

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Environmental factors including temperature and humidity affect the temporal pattern of reproduction in the camel. We found increased development of two histologically distinct populations of Leydig cells during the breeding season. During the non-breeding season spermatogenesis was endured, but only one population of Leydig cells was well represented whereas the second population was reduced. The objective of this investigation was to determine the potential of the testis to synthesize testosterone *in vitro* during the peak of the breeding season. Incubation of testicular homogenate with radioactive substrates indicated the following: (1) testosterone was synthesized at a very slow rate, primarily via the 4-ene pathway; (2) the activity of the converting enzymes (3β-hydroxysteroid dehydrogenase and 5-ene isomerase), 17α-hydroxylase, 17-20 lyase and 17β-hydroxysteroid dehydrogenase was relatively low and (3) high activity of enzymes not associated with testosterone production via the 4-ene or 5-ene routes was observed.

41. The effects of ACTH and dexamethasone administration on testicular function

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The effects of ACTH simulated stress on plasma and testicular levels of 9 steroids in the biosynthetic pathway of testosterone, and the levels of 6 unconjugated steroids in plasma were determined to evaluate the effects of stress on testicular function. In addition, these levels were compared to the levels determined after dexamethasone suppression of the adrenal. ACTH treatment resulted in a significant fall in testicular levels of all the steroids, and a fall in plasma unconjugated and conjugated testosterone, dihydrotestosterone, and plasma conjugated pregnenolone levels. In contrast, levels of plasma unconjugated pregnenolone, progesterone, and 20α-dihydroprogesterone rose significantly. Plasma unconjugated progesterone, 17-hydroxyprogesterone, 17-hydroxypregnenolone, testosterone, dihydrotestosterone, and 20α-dihydroprogesterone, and plasma conjugated testosterone, dihydrotestosterone, and pregnenolone levels also fell significantly. It is concluded that both ACTH and dexamethasone exert a strong suppressive effect on testicular function.

42. Influence of various factors on embryonic chick gonad steroid hormone production during organ culture

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Gonads from chick embryos of 7½–18 days incubation were cultured on synthetic medium during 24 and 48 h. Radioimmunoassay, after ether extraction of the media and of the homogenized organs, allowed us to determine the embryonic gonads steroid production and secretion. There were significant differences according to sex, stage of development and size of gonads but several factors seem to modify the *in vitro* production rates. Medium renewal at 24 h increased, chiefly in male, total steroid production during the second day of culture. Addition of precursors of sex hormones such as pregnenolone, DHA and 4ene-androstenedione to the culture media, increased significantly the sex steroid production but respected the sexual differences observed in control gonads. These experiments gave information on steroidogenic activity during culture and on the sex steroid biosynthetic pathways used by bird embryonic gonads. Addition of HCG increased significantly the total steroid production (chiefly DHA, estrogens and testosterone) and also permitted several conclusions on the biosynthetic pathways. Furthermore, these experiments show that the gonads had to be stimulated immediately by a trophic hormone at the beginning of explantation to be responsive 24 h later. Finally, we have shown a seasonal influence on steroid production. Gonads, removed from embryos incubated between the 15th of March and the 15th of September 'Summer gonads' were much more active than 'Winter' ones (15th September–15th March).

4. METABOLISM

43. The mineralocorticoid activity of reduced metabolites of aldosterone in rats

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From recent experiments in our laboratories, the hepatic metabolism of aldosterone to its polar and to its reduced metabolites has been suggested to be of major importance in the mechanism of action of this hormone in the kidney. We have shown that the dose dependent quantities of both the polar aldosterone metabolites and tetrahydroaldosterone in the kidney during the latent period of the hormone correlate well with the magnitude of the physiological response to aldosterone in the kidney. The biological activity of some of the reduced metabolites of aldosterone 5α-dihydroaldosterone and three of the isomers of tetrahydroaldosterone, 3α,5β-tetrahydroaldosterone, 3β,5β-tetrahydroaldosterone and 3β,5α-tetrahydroaldosterone were examined. The mineralocorticoid activity of these steroids was determined in adrenalectomized male rats by measuring the changes in urinary NA^+/K^+ ratios following their s.c. administration. All these reduced metabolites of aldosterone were found to possess mineralocorticoid activity, ranging from 1/30th to 1/500th of that of aldosterone. Of major interest, both 5α-dihydroaldosterone and 3α,5β-tetrahydroaldosterone were shown to possess considerable mineralocorticoid activity, 1/30 and 1/50 respectively, that of the activity of aldosterone. 5α-dihydroaldosterone possesses approximately twice the biological activity of 3α,5β-tetrahydroaldosterone. Both 3β,5β-, and 3β,5α-