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CHANGES IN SECRETORY FUNCTIONS OF EXOCRINE PANCREAS IN RELATION TO EGG-LAYING OF THE HEN

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Secretory functions of the exocrine pancreas in relation to egg-laying of the hen were examined by measuring CCK-8-induced release of digestive enzyme and enzyme contents. The hens were divided into four groups: groups of 121 days, 134 days, 168 days after 7 days from the first egg and 195 days.

Pancreatic juice flow, total protein output, amylase output and trypsin output after administration of 0.03 μg CCK-8 per kg body weight reached their peaks 10 min after the administrations, declined gradually, and reached their resting levels 40 min after the administrations. Similar tendency of secretory responses was observed when 0.03 μg and 3.00 μg CCK-8 per kg body weight were administrated.

Outputs of total protein, amylase and trypsin were measured after administration in a series of three doses of CCK-8: 0.03 μg , 0.30 μg and 3.00 μg per kg body weight. Dose-response relations were thus obtained in the four groups. No different relation was observed between the pancreatic juice flow and the doses of CCK-8.

The response of total protein output induced by administration of three different doses of CCK-8 in the group of 134 days was about 3.6 times larger than the corresponding responses in the group of 121 days. The responses in the group of 168 days were similar to those in the group of 121 days. The responses in the group of 195 days were in between those of the 121 days' and the 134 days' group. Dose-response relations for amylase output were similar to those for total protein output. Comparable dose-response relations were obtained for the secretory response per DNA content in the pancreas.

Amylase and trypsin contents per wet weight of the pancreas in the groups of 134 days, 168 days and 195 days were significantly larger than the corresponding values in the group of 121 days. A similar tendency was also obtained in the amylase and trypsin contents per DNA content in the pancreas.

These results show that the secretory functions and digestive enzyme contents may increase several weeks before initiation of egg-laying.