The hypothesis that serotonin (5-HT) and dopamine stimulate prolactin (PRL) release, either directly from the pituitary gland or by acting through Vasoactive Intestinal Peptide (VIP), was investigated by assessing the role of hypothalamic dopamine and 5-HT in the control of broodiness and PRL release in Cantonese native chicken breed called the Yuehuang hen. A second objective was to assess the involvement of hypothalamic VIP in the control of broodiness and PRL release by using dopamine and serotonin receptor antagonists respectively. In Experiment 1, two hundred laying hens from battery cages were transferred to floor pens with nest boxes to induce broodiness. Starting from the second day after the onset of broodiness, sixty hens were allotted into groups 1, 2 and 3 respectively, corresponding to chlorpromazine-treated (n = 20), cyproheptadine-treated (n = 20) and control (n = 20) groups. Blood samples were collected from the wing veins of hens in each group on days 2, 5, 9, 14 and 19 respectively after the onset of broodiness for radioimmunoassay of PRL and Luteinizing Hormone (LH). Results indicate that in the drug treated hens which terminated broodiness, the concentration of plasma PRL decreased significantly ($p<0.01$) while the concentration of plasma LH increased significantly ($p<0.05$) as compared to the control hens. The plasma PRL levels showed no significant ($p>0.05$) changes between the chlorpromazine and cyproheptadine treated hens. Within the chlorpromazine and cyproheptadine treated hens, there were significant ($p<0.05$) changes in plasma PRL levels between day 2 and days 5, 9, 14 and 19. The plasma PRL levels in the control hens showed no significant ($p>0.05$) changes throughout the blood sampling periods. Sixteen (80%) chlorpromazine treated hens terminated broodiness on an average of 4.6±0.8 days but four hens (20%) did not. However, thirteen (65%) cyproheptadine treated hens terminated broodiness on an average of 2.3±0.2 days while seven (35%) did not. In Experiment 2, sixty animals were used but their management and drug treatment for group 1 (n = 10) and group 2 (n = 10) were the same as described in Experiment 1. Group 3 (n = 10) served as the control. Eight hens each from groups 1, 2 and 3 were randomly selected for immunohistochemical studies. On day 7 after the onset of broodiness, hypothalamus from anaesthetized chlorpromazine and cyproheptadine treated hens as well as control hens were processed for immunohistochemical localization of VIP neurons in the hypothalamus of Yuehuang hens. Morphological observation showed a higher number of VIP neurons in the hypothalamus of the control hens. A few VIP neurons which were very faint were also found in the hypothalamus of the chlorpromazine and cyproheptadine treated hens. Results of these studies indicate a relationship between the functions of dopamine and 5-HT neurons in the hypothalamus and reproductive activities in domestic hens. They are consistent with the view that hypothalamic dopamine and 5-HT are regulators of PRL release and that using drugs which inhibit the functional activities of these neurotransmitters can inhibit PRL release to disrupt broodiness in hens to maintain egg production. The results also indicate a causal relationship between hypothalamic VIP and changes in PRL secretion associated with reproductive activities in domestic hens. This is consistent with the view that VIP might be an important hypothalamic PRL releasing

neuropeptide and also indicate that VIP might be a physiological PRL regulatory hormone in domestic hens.