Résumé. Le décapeptide synthétique Val-His-Leu-Ser-Ala-Glu-Glu-Lys-Glu-Ala, dont la structure correspond à celle proposée pour la hormone hypothalamique de libération de l'hormone de croissance hypophysaire (GH-RH) a été étudié in vitro pour contrôler l'activité de la GH-RH. Le décapeptide synthétique a stimulé la sécretion de l'hormone GH comme on a pu le constater par des dosages biologiques. L'utilisation du système radioimmunologique pour le dosage de la GH n'a pas fait apparaître cette augmentation de décharge de GH dans l'hypophyse, en présence de la GH-RH d'origine naturelle ou du décapeptide synthétique.

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Effect of Pregnancy and Feeding Pattern on Tryptophan Pyrrolase in the Rat

The activity of liver tryptophan pyrrolase in the pregnant rat has been reported to be increased on the 13th day of pregnancy[1] and to be unchanged from normal levels on the 19th day[2]. The ability of glucocorticoids to raise the level of liver tryptophan pyrrolase is well-established[3,4] and the increase in this enzyme in certain conditions of of stress[5,6] and following oestrogen administration[7] has been attributed to adrenal cortical activity. In the pregnant rat there is no evidence of an increase in plasma oestrogen until the day preceding partuition[8], the level of circulating corticosterone is depressed from the 8th day of pregnancy onwards[9] and the ability of the liver to inactivate corticosterone is increased from the 12th day[10]. The present work was therefore undertaken to study more fully the activity of tryptophan pyrrolase in the rat during pregnancy and to investigate the response of the enzyme to different feeding patterns in the pregnant rat.

Methods. Virgin Wistar rats of fasting body weight 180–200 g were mated and along with non-pregnant rats of similar weight allowed free access to commercial rat cake (North Eastern Agricultural Co-operative, Ltd., Aberdeen) or fed daily at 15.00 h 14 g of this rat cake, powdered and made into a paste with water. Rats were killed at 09.00 h unless stated otherwise at various stages of pregnancy, day 1 being the day following the observation of spermatozoa in the vagina. Non-pregnant rats were killed after either 13 or 20 days on the two regimes. Tryptophan pyrrolase activity was assayed essentially as described by Knox, Piras and Tokuyama[11]. Statistical evaluation of results was carried out using Student's *t*-test.

Results and discussion. 13- and 20-day pregnant rats fed freely had significantly greater hepatic tryptophan pyrrolase activity than non-pregnant rats, the increase on the 20th day being significantly greater than that on the 13th day (Table). Pregnant rats voluntarily increase their food intake by up to 30%[12] and the level of tryprophan pyrrolase in normal rats varies with the pattern of feeding and amount of food eaten[13]. Thus the increase observed in tryptophan pyrrolase may be due to variations in dietary habits of the pregnant animals. For this reason the enzyme level in pregnant and control rats was compared when both were fed the same amount of diet as a single meal daily at 15.00 h. On the 8th, 10th and 11th days of pregnancy the level of tryptophan pyrrolase was not significantly different from that in the non-pregnant animals. Except on the 14th day, from the 12th day of pregnancy tryptophan pyrrolase was higher than in the non-pregnant rat with levels between the 16th and 20th days being higher than those on the 15th day or earlier (Figure 1). The fact that normal levels of tryptophan pyrrolase have been previously reported in 19-day pregnant rats[2] may be due to the fact that in these earlier studies the method of enzyme assay used may not have ensured complete activation of all enzyme molecules present. The lower activity of tryptophan pyrrolase on the 14th day of pregnancy may be related to the fact that induction of this enzyme does not occur when liver DNA is being synthesised[14]. Campbell and Kosterlitz[15] found increases in DNA content and a tendency for increased incorporation of $^{32}PO_4$ into DNA in livers of 14-day pregnant rats. Restriction of food intake did not significantly affect the absolute level of enzyme activity on the 13th and 20th days of pregnancy

Tryptophan pyrrolase activity in livers of non-pregnant and 13- and 20-day pregnant rats

Treatment	μmoles kynurenine (g liver/h)	*P* I	*P* II
non-pregnant (9)	3.34±0.38	—	—
13-day pregnant (6)	5.96±0.84	<0.01	—
20-day pregnant (3)	11.17±1.00	<0.001	<0.025

Results are expressed as the mean ± S.E. Numbers in parentheses represent the number of animals in each group. I. Statistical significance of difference between pregnant and non-pregnant groups. II. Statistical difference between the two pregnant groups.

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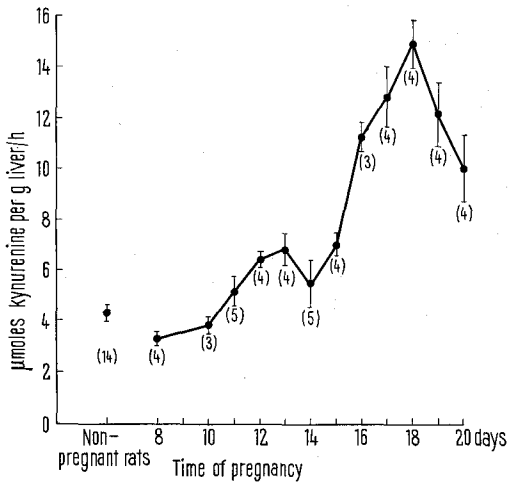

Fig. 1. Variation in liver tryptophan pyrrolase activity from the 8th to 20th day of pregnancy. Values are expressed as the mean ± S.E.M. The number of animals in each group is given in parenthesis.

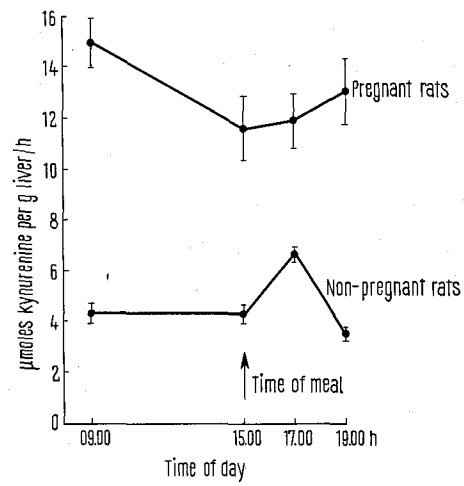

Fig. 2. Variation in liver tryptophan pyrrolase activity in 18-day pregnant and non-pregnant rats after feeding of a single meal at 15.00 h. Values are the mean ± S.E.M. of 14 rats in the case of the non-pregnant rats killed at 09.00 h and of 4 rats in the case of all other groups.

(Figure 1 and Table). The level in non-pregnant rats was however significantly lowered by restricting their food intake ($P < 0.05$), confirming a previous observation of FULLER[13]. Fuller also showed that when normal rats were fed with single daily meals, tryptophan pyrrolase activity increased during the 2–3 h after they had eaten. This effect was also noted in the present work in non-pregnant rats, where a 51% increase in activity occurred 2 h after the meal (Figure 2). However in 18-day pregnant rats, tryptophan pyrrolase was not significantly altered in the immediate post-absorptive period (Figure 2) even although all the food offered was consumed within 1 h. Thus in the pregnant rat, tryptophan pyrrolase level appears to be insensitive to food intake.

The temporal pattern of change in tryptophan pyrrolase activity during pregnancy bears a close similarity to that shown by liver RNA[15]. A placental factor has been shown to be involved in liver RNA metabolism in pregnancy[16] and the possibility therefore exists that the placenta may also have a regulatory effect on tryptophan pyrrolase. The facts that the rise in tryptophan pyrrolase was not evident until the placenta was established and that rat placental endocrine function has been shown to be independent of diet[17] lend some support to this view.

Résumé. Chez la rate, la dose de tryptophan pyrrolase fut augmentée du douxième au quinzième jour de gestation. L'activité de ces rates gravides ne changea pas quand leur nourriture fut modifiée.

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Influence of Dietary Methionine on Rat Growth and Thyroid Activity

COHEN, CHOITZ and BERG[1] reported that the addition of 1.8% methionine to a diet containing 12% casein produced marked growth depression in rats. They also found that while 1.45% cystine added to the diet did not affect the growth rate, the addition of 1.6% homocystine did greatly decrease the growth rate. If high dietary methionine were converted to homocystine at a rate greater than that which could be removed by metabolic processes, the latter's toxicity might decrease the growth rate of the rat in a similar fashion. BENEVENGA and HARPER[2] have reported that feeding DL-homocystine equivalent in sulfur to 3% methionine with a 10% casein diet reduced growth rate of rats about the same extent as occurred with feeding methionine. Both dietary treatments[2] produced pathological lesions in the spleen, pancreas, liver, small intestine and kidney of the rat. Methionine levels in the plasma of rats fed 2% methionine with 18% casein diet were increased[3] from 10 µg/ml to 200 µg/ml by the dietary treatment. The observed pathological changes may be related[4] to methionine's effect on certain tissue enzymes, e.g., as an essential amino acid in structure of tissue protein and as a methylation reagent both effecting protein anabolism. Dietary

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