Experiments were carried out to find the effect of adding different amounts of tryptophane to fructose and then determining the sugar by the resorcinol method. As seen from the Table, with the increase in the amount of tryptophane there was a corresponding increase in the fructose values as estimated by the resorcinol method. So these results made it evident that the error observed in the estimation of seminal fructose by the resorcinol method would depend on the concentration of tryptophane present in semen.

It has already been shown that, in the cnromatographic method, fructose became separated from other reducing substances, particularly tryptophane, and thus the fructose values obtained by using the chromatographic method would be more accurate. These observations will hold true for any biological material containing tryptophane in which fructose is to be estimated by the resorcinol method. Results strongly indicate that the chromatographic method should prove of greater value in estimating fructose in the presence of tryptophane[9].

Effect of varying concentrations of tryptophane on the estimation of fructose by the resorcinol method

Tube No.	Fructose mg	Tryptophane mg	Optical density	mg fructose obtained in the presence of tryptophane	Difference in fructose (mg) in the presence of tryptophane
A	0.5	—	0.700	0.50	—
B	0.5	0.1	0.750	0.53	0.03
C	0.5	0.2	0.900	0.64	0.14
D	0.5	0.3	1.100	0.78	0.28
E	0.5	0.4	1.200	0.85	0.35

Résumé. Nous avons essayé de chercher la nature des substances réduisantes dans la semence humaine. Ces substances interviennent dans l'estimation quantitative du fructose d'après la méthode de Roe, utilisant le resorcinol. L'existence du tryptophane dans la semence humaine est déjà démontrée. En présence du tryptophane, la quantité du fructose obtenue est plus élevée que la quantité du fructose obtenue en absence du tryptophane.

Il semble, selon nos résultats, que l'estimation quantitative du fructose selon la méthode de Roe dépend de la quantité de tryptophane présente dans la semence humaine.

A. R. Sheth and Shanta S. Rao

Reproductive Physiology Unit, Indian Cancer Research Centre, Parel, Bombay (India), August 30, 1962.

[9] We are deeply indebted to the Director, Dr. V. R. Khanolkar, for his help and criticism during the course of this work. We are also grateful to Shri N. A. Dhonde for his technical assistance.

Occurrence of Hibernation in the Golden Hamster, *Mesocricetus auratus* Waterhouse

Introduction. In the course of an investigation of hibernation in the golden hamster, with particular attention paid to the endocrine glands (Smit-Vis, in press), the dates of entrance into the cold environment (refrigerator, $+5°C \pm 0.5$) and into hibernation respectively were registered as a matter of routine. Although, therefore, not collected for the purpose of studying the occurrence of hibernation, these data will be presented here as they are thought to give an explanation of the varying length of the prelethargic period (i.e. time in cold environment before hibernation). A hypothesis may be put forward, which allows the approximate length of the prelethargic period during the course of the year to be predicted.

Observations and Discussion. The dates of the entrance into the refrigerator and of the first hibernation period, together with the length of the prelethargic period for 26 hamsters, are summarized in the Table. The animals were kept in separate cages. Food and water were supplied *ad libitum* and sufficient hay was given for nestbuilding. Twice a day the animals were inspected and at the same time the shallow refrigerator was ventilated. At the beginning of the experiments, the age of the hamsters varied between three and six months. The animals are grouped according to the month in which they came into the cold environment. For each group an average of the prelethargic periods with its standard deviation is given in the right column of the Table. The shortening of the prelethargic time from November up to February (leaving out the divergent value for hamster 162; the reason for this will be discussed later) is noteworthy. Using Student's test, the differences between the group averages were proved to be statistically significant at the 5% level (Nov./Dec., $t_0(13) = 2.27 > t_{0.975}(13) = 2.16$; Dec./Jan., $t_0(11) = 2.22 > t_{0.975}(11) = 2.20$; Jan./Feb., $t_0(5) = 3.28 > t_{0.975}(5) = 2.57$.

In consequence of the shortening of the prelethargic periods, the observed hamsters entered hibernation in the course of February, with only a few exceptions, regardless of the date of entrance into the refrigerator (Figure 1).

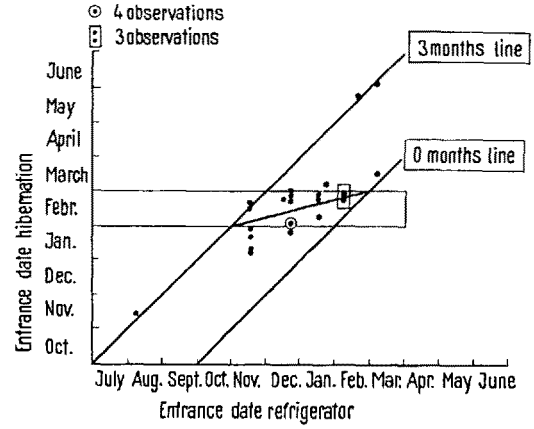

Fig. 1

The divergent value found for the prelethargic time of hamster 162 can be considered as an extreme value in the group of 'February' hamsters, because Dixon's test showed that for hamster 162 the following expression holds:

$$r_{10} = 0.94 > r_{R(n=4,\alpha=0.01)} = 0.889.$$

This test could not be applied to the 'March' hamsters, the number of observations being too small. Nevertheless,

by analogy with the 'February' group, we may also consider the prelethargic time for hamster 51 as an extreme value.

A theoretical explanation of the extreme values for hamsters 162 and 51 will be proposed, and we may therefore exclude these two hamsters when calculating the regression line. The equation for this line, drawn in Figure 1, is then:

$$y = 0.24x + 90.66$$

where x and y are counted in days from November 1st.

Attention is drawn to the fact that the regression line indeed falls completely within the 'February' column. All data plotted in Figure 1 fall remarkably well between two lines, representing a length of prelethargic period of 0 and 3 months respectively. The latter fits in very well with: 1, the observation on the 'August' hamster; 2, the two longest prelethargic periods observed in the 'November' group; and 3, the two extreme values mentioned above.

In order to explain the distribution of data in Figure 1, the following hypothesis is proposed:

Under the conditions prevalent in our experiments a golden hamster needs about 3 months to arrive at a stage at which it can hibernate. The physiological processes occurring during this period are induced as soon as the animal enters an environment with a suitably low temperature, but set in 'spontaneously' (i.e. not induced by low temperature) during the course of November. As a result, the prelethargic period will decrease in length from November onward. However, when the external conditions at the end of the 'spontaneous' preparation period are not such that the hamster can actually enter the lethargic state, then the ability to hibernate is lost and the animal again needs about 3 months from the moment it is brought into the right external conditions to recover this ability.

The second part of the hypothesis is based on the two extreme values from respectively February and March.

For an illustration of our hypothesis we may refer to Figure 2. This graph can be obtained from Figure 1 by a simple transformation. The regression line here is given by the equation.

$$y = -0.76x + 90.66,$$

x being counted in days from November 1st.

The length in days of the prelethargic period can be considered as the reverse of the predisposition for hibernation. During August the animal is not predisposed at all, as may be concluded from the long preparation time needed to enter the lethargic state. A predisposition is gradually developed from November onward and reaches its maximal development during February, but is then lost. The predisposition for hibernation is known in the literature as 'Winterschlafbereitschaft' (EISENTRAUT[1], POHL[2]).

Date of entering the cold environment and length of prelethargic period

Hamster No.	sex	Entrance date refrigerator	Entrance date hibernation	Prelethargic period length (days)	average and standard deviation
66	♂	Aug. 8	Nov. 12	92	
137	♂	Nov. 17	Feb. 15	90	
140	♀	Nov. 17	Jan. 21	65	
142	♀	Nov. 17	Feb. 21	96	
143	♂	Nov. 17	Jan. 6	50	
148	♂	Nov. 17	Jan. 10	54	
151	♀	Nov. 17	Jan. 27	71	71 s = 18.7
27	♂	Dec. 17	Feb. 22	67	
1	♂	Dec. 21	Jan. 25	35	
3	♀	Dec. 21	Feb. 2	43	
4	♀	Dec. 21	Feb. 2	43	
5	♀	Dec. 21	Feb. 25	66	
6	♂	Dec. 21	Feb. 2	43	
9	♂	Dec. 21	Feb. 1	42	
10	♀	Dec. 21	Feb. 29	70	
11	♂	Dec. 21	Feb. 20	61	52 s = 13.5
37	♀	Jan. 17	Feb. 27	41	
38	♀	Jan. 17	Feb. 8	22	
40	♂	Jan. 17	Feb. 22	36	
42	♂	Jan. 23	Mar. 7	43	36 s = 9.5
44	♀	Feb. 8	Feb. 22	14	
45	♂	Feb. 8	Feb. 27	19	
46	♀	Feb. 8	Feb. 25	17	
162	♂	Feb. 17	May 23	95	36 s = 39.2 (17 s = 2.5)[a]
49	♀	Mar. 8	Mar. 15	7	
51	♂	Mar. 8	June 2	86	

[a] Average in brackets for 'February' hamsters, hamster 162 excluded.

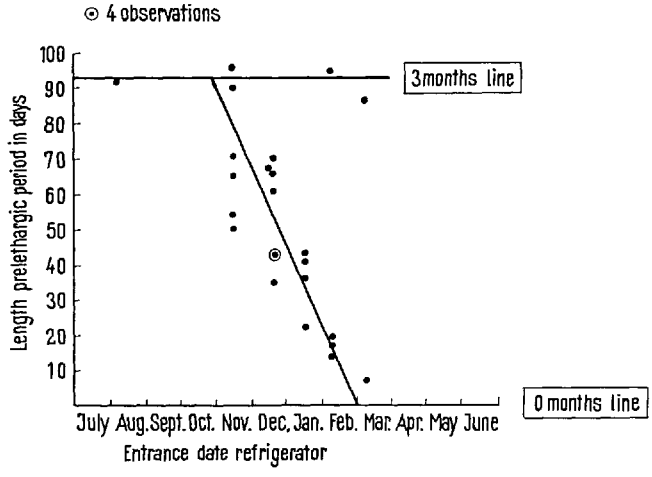

Fig. 2

Résumé. Une hypothèse est présentée pour expliquer la variabilité en durée de la période préléthargique au cours de l'année. La période préléthargique pouvait être approximée à trois mois. Dès novembre, le Hamster développe une prédisposition, résultant dans un raccourcissement de la période préléthargique. En février, la prédisposition pour le sommeil hivernal est au maximum, mais ensuite elle est perdue.

J. H. SMIT-VIS and G. J. SMIT

Anatomisch-Embryologisch Laboratorium, Universiteit van Amsterdam and Central Institute for Brain Research, Amsterdam (The Netherlands), February 21, 1963.

[1] M. EISENTRAUT, *Der Winterschlaf mit seinen ökologischen und physiologischen Begleiterscheinungen* (Fischer-Verlag, Jena 1956).

[2] H. POHL, Z. vgl. Physiol. *45*, 109 (1961).