

formula $C_{57} H_{104} O_6$, whilst that of protein is indicated by the formula $C_{72} H_{112} N_{18} SO_{22}$, and that of carbohydrates by $C_6 H_{12} O_6$. From a comparison of these formulæ it is evident that in fats the ratio of the carbon and hydrogen (taken together) to the oxygen is greater than in the protein and carbohydrates. Now you are aware that the heat in the body is produced by combustion, and as carbon and hydrogen are the only two combustible substances in these compounds (with the exception of a small amount of sulphur in proteins), that class of compounds in which these two elements (not already combined with oxygen) predominate must necessarily be the greater heat producer. Rubner has very carefully estimated the relative heat value of fat, carbohydrates and protein with the following results:—

100 grammes of fat are equivalent to 211 grammes of protein, to 132 grammes of starch, to 234 grammes of cane sugar and to 256 grammes of grape sugar.

Besides being used as fuel to keep up the body temperature and produce energy, fats are stored up in the body as fat.

Perceiving that fats are absorbed with the food and deposited in the body, physiologists have asked themselves whether there is a direct transposition into the adipose tissue without any previous decomposition. Radziejewsky, Subbotin and others endeavoured to solve the problem.

Radziejewsky fed a dog with erucin, the glyceride of erucic acid, but could find only small quantities of it in the tissues.

Subbotin fed another dog with spermaceti and found none at all in the fat cells, and only traces in the intestinal fats and internal organs. What conclusions could he draw, if not that in the case of carnivora the fat in the food does not pass directly into the cells of the body?

These experiments were repeated by I. Munk, who fed a dog, which had fasted a long time previously, with erucin and he got contrary results finding a considerable amount of the neutral fat. This, however, does not prove that the fat is transferred directly without previous decomposition, for is it not possible that the fat may be saponified and absorbed as a soap, and the neutral fat of the same composition afterwards synthesized in the epithelium cells? In fact the most credited and better experimentally sustained idea