Domestic Economy.

ANIMAL FOOD.

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In order that the chemical changes produced by cooking may be clearly understood, it is necessary first to examine into the composition of meat. All flesh consists of fibrin or fibres, albumen, gelatine fat, and osmazome or flavoring extract. The fibres and fat are insoluble in water, and in making beef-tea they are the parts that remain undissolved. The albumen of meat is similar to the white of an egg before it is cooked. It is soluble in warm or cold water, but is coagulated if the temperature be raised to the boiling point. If meat is properly cooked the albumen prevents the contraction and hardening of the fibre when heat is applied, and aids in making it tender. Since the proportion is greater in young meats, they are, if properly cooked, more tender than old meats. This advantage is, however, negatived by the coagulation of the albumen in young meats, and the consequent deficiency in the amount of juice. The old meats, as beef and mutton, since they contain less albumen and a greater proportion of osmazome, are more juicy and flavorous. The osmazome is soluble in water, but when the albumen is coagulated by heat it is entrapped in its meshes and retained. It therefore follows that if it is desired to dissolve out the osmazome, the temperature of the water must be kept considerably below the boiling point.

Having before us this brief outline of the composition of meat, and the action of heat upon its constituents, we are prepared to pass to the consideration of the ordinary methods of cooking, and the chemical action involved in each.

The object to be attained in the preparation of a soup, or the extract of meat, is to dissolve in water as much as possible of the flesh. By proceeding in a rational manner, we may cause the water to take up all the constituents except the fibre and the fat; but if the proper application of the heat be neglected, the solution will contain only a very small part of the soluble ingredients. Recollecting that the albumen will be coagulated if the temperature approaches the boiling point, and so rendered entirely insoluble, it is evident that the proper procedure is to place the meat in cold water, and keep its temperature at from 100 deg. to 150 deg. for a considerable period of time, depending upon the size of the mass. We thus allow the water to exert its solvent power, and obtain an extract containing nearly all the osmazome, albumen. and gelatine. If the meat has been finely divided, and the action long continued, the result will be a strong beef, chicken or other tea, according to the flesh employed. If it has remained in mass, and the action of the hot water continued a short period, the solution formed will be a weak soup.

Under some circumstances, soup is prepared by treating bones and tendons, or the gristly structures, in a Papin's digester. This consists of a strong metallic boiler, in which the steam can be confined, and pressure obtained. Under the increase of pressure, the boiling point of water rises, its solvent power over gelatine is increased, and we may thus obtain a strong solution of this material, which answers the purpose of giving body to a soup, but does not of itself possess any very great value, as its nutritive power is very low. The solution usually becomes solid when cool, forming a jelly. Such preparations were formerly, and are still used extensively in the sick room, under the impression that they are very nutritious; but this is now known to be an error, for gelatine is not incorporated with the tissues of the body, but is passed out of the system very quickly as urea.

The gelatine solution described above may also be obtained by crushing bones to a coarse powder, or cutting tendonous material into very fine pieces, and boiling them for a long time. This method is the best adapted for domestic purposes. Within a few years, the sources of material from which gelatine can be prepared have been greatly increased by the discovery of a process by which the tannin is removed from old leather, leaving the skin in a condition in which the freed gelatine is soluble in water. By this process, gelatine is now obtained from old shoes or dilapidated harness; and the history of the voyages and experiences of the atoms of gelatine in an elegant mould of jelly, as it is placed by the confectioner on an evening supper-table, would be curious and interesting.

When the meat is to be cooked by boiling, it is desirable that as little as possible of the nutriment should be extracted by the water, and, at the same time, the heat should be so applied that the albumen may