

dextrinized or rendered soluble, it is evident that the Tillson product has been heated slightly higher and that different lots have not been submitted to a uniform temperature.

Among the cooked, and the cooked and malted classes of foods there is sufficient variation in the amount of soluble matter to show that the different lots or batches of the same kind of food are not always prepared in exactly the same manner. It may be that in some lots more malt was used, or the malting period was longer, or that the toasting or parching process to which the foods are generally submitted was more thorough—all of which would cause variation in the percentage amounts of soluble matter.

INFLUENCE OF COOKING ON SOLUBILITY OF FOODS.

In general it may be safely stated that the thorough cooking of cereal foods is quite as important as the proportion of the nutrients which they contain. The chief purposes of cooking are: first, to sterilize the material, so that any undesirable bacteria, if accidentally present, may be destroyed; second, to improve flavor—making the food more appetizing and thus increasing its digestibility by stimulating the flow of digestive juices; and third, to so change the structure of the material, especially the carbohydrates, that they may be more readily digested. Possibly the last may be regarded as the most important, because, as previously stated, starch, which forms a very large proportion of these foods, is enclosed in cells, the walls of which are composed of crude fibre. This crude fibre is practically indigestible, and unless the walls which it forms are broken, comparatively little of the starch is digested and absorbed. In the cooking process, the contents of the cells expand and the walls burst, allowing the contents to come in direct contact with the water, when it is at least partially converted into soluble forms. Thorough cooking of the cereals really consists in rupturing these cell walls and in securing a maximum quantity of starch in a soluble form. The solubility of the protein is generally lessened by cooking, especially at high temperature. Long, slow cooking will soften the crude fibre and change the starch to soluble forms without materially decreasing the solubility of the proteids. Some experiments seem to show that, while the protein is rendered insoluble in the first part of the cooking, long continued action of the heat somewhat changes them into soluble forms.

It is very generally taught that oatmeal and farinas should be cooked six or eight hours before serving. The general practice throughout the country is, however, to cook for a very much shorter period, probably not more than twenty minutes to half an hour. To gather some information regarding the extent of the changes affected by the length of time the food is cooked and to get some data for comparison with the foods sold as ready-to-serve, we cooked oat, wheat, and corn meals for periods of twenty minutes, two hours, five hours, and eight hours, and analyzed a water extract of each, prepared in the same manner as that previously