

disadvantage in connection with potatoes is that they have been in contact with the earth and possess so many cracks and eyes that they are difficult to free from bacteria always present in large numbers in the earth, and for this reason many large bakers in English towns have given up using them. If potatoes are used, they should be most thoroughly scrubbed in several changes of water, and then boiled or steamed till cooked. It is a common practice to mash the potatoes up with the skins. This is a mistake, and may cause trouble for the following reasons: The boiling will not kill many of the spores of bacteria which are upon the skin; and if the skin containing them is mixed up with the ferment, the spores will commence to grow, and, as has been shown elsewhere, may give bad results. Further, the substance just under the skin consists partly of *solanin*, which, when the potato cools, gives in many cases a rank and bitter taste that may slightly taint the bread. For these reasons, the skins should be thrown away. It is better to boil the potatoes again after peeling them, as by so doing the starch, which, in its raw state, is less capable of acting as a yeast food, may be gelatinised as much as possible.

When flour is used, it is better to cook it than to use it raw, for the same reasons as those for which the potato is cooked, viz. to destroy germ life and to gelatinise the starch. It may easily be cooked by mixing with cold water and bringing to the boil,—the result of which should be a thin paste. If only the highest grades of flour are used, it will be an advantage to use a little sugar. Raw flour is frequently added to cooked potatoes, cooked flour, and malt; but raw flour contains small quantities of diastase, the amount decreasing as the grade of the flour improves; and, as already intimated, diastase has the power of changing starch into sugar. Now, it has already been stated that the lower grades of flour, which contain the largest quantity of diastase, also contain the largest number of bacteria; and, for this reason, it is questionable whether raw flour should be added to a properly gelatinised substance. The starch has to be gelatinised, because in its raw condition it is insoluble, and so cannot be acted upon by the yeast; but when it is gelatinised, the insoluble outer covering of the starch cell is ruptured, and the soluble portion is then available as yeast food.

In places where malt can be obtained it will be found a good substitute for potatoes. Yeast grows exceedingly well in malt extract, and it is easily prepared for use. To make the malt extract, the raw malt must first be coarsely ground and then "mashed" in the same manner as is done in breweries. On no account should the malt be boiled, as is sometimes done, because the boiling destroys its diastatic power. Malt contains starch and diastase and also sugar. The mashing is performed to cause the diastase to act upon the starch and to convert it into sugar. High heat, accompanied by moisture, will destroy the diastase, and then a great portion of the contents of the malt will be destroyed. Badly prepared malt, that is, malt which has been prepared from grains that have not germinated sufficiently or that have been heated too highly in the early drying stages, does not