

## Starch in the Diet.

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STARCH TAKES AN IMPORTANT PART in the dietary but used in excessive quantities can be detrimental to health.

Foods containing starch are derived from the vegetable group including flour and potatoes, and most meals, prepared in the generally accepted way, include a certain amount of one or both in their composition. Also certain patent foods and synthetic combinations contain a high percentage of starch and not always of vegetable origin.

Bread and potatoes, by virtue of their bulk, are frequently used as "fill-up" foods, and by this fact alone, a larger ingestion of starch is consumed, with detrimental effects on the digestive processes.

During digestion starch undergoes considerable changes in order to make it easily assimilable in the human body, being converted into sugar, and brief references to these changes may not be out of place.

When food containing starch such as bread and so on, is received by the mouth, the saliva quickly acts on it, and unlike protein such as meat, it undergoes chemical changes.

If it is retained in the mouth for a considerable period, being thoroughly masticated, it will be converted into a form of starch before it passes on to the stomach, where the digestive acids have no effect on it, apart from restricting the digestive effects of the prior insalivation.

Before further action is taken on converted starch it has to pass on to the small intestine, where it meets other fluids which complete the conversion, started in the mouth, of the starch into sugar. These changes continue until the starch is reduced into glucose, and therefore ready for absorption into the bloodstream, to be distributed throughout the human body.

When these processes of starch conversion into sugar and finally into glucose for absorption by the blood, are fully understood and appreciated, then the preparation of food to be consumed can be arranged and balanced accordingly.

Starchy foods should always be taken in such a form that insalivation is stimulated and mastication demanded, thus they should consist of rather dry matter.

For this reason toast and hard biscuits are better than ordinary bread, and on the contrary soft mushy starchy foods should be avoided. For example, prepared and pre-cooked cereal foods are too easy for the mouth and therefore pass too quickly into the stomach. The same may be said of puddings containing flour and dough in the form of crusts and dumplings, for they do not encourage mastication, and slip down the gullet before the saliva can do its essential work.

Any accompanying liquid or drink which tends to soften starchy food in the mouth is detrimental and should be avoided, but hard crunchy foods such as raw salads demand mastication before they can be swallowed, and therefore are excellent at all times. Celery is particularly suitable in this respect owing to its fibrous nature.

Starch as such is not digested in the stomach and therefore requires to be passed into the small intestine as soon as possible, but if it is combined with protein foods which need the assistance of digestive acids in the stomach, it stays too long in the stomach and begins to ferment, indicating thereby that the digestion is not

strong enough to deal with starch and protein at the same time. For this reason bread and boiled and mushy potatoes should not be combined with meats, fish, and so on, unless the alimentary tract is in a superb condition, and able to accommodate itself to this difficult problem.

When digestive disturbances are present it is a mistake to combine potatoes or bread with their heavy starch content with meats with their proteins. Meat puddings and pies, and milk puddings after meat and starch accompaniments, is inviting indigestion with its many distressing symptoms.

Having reviewed starch as a part of human diet and its effect if wrongly used, it is now opportune to consider the best way of using it.

No other food is used so extensively as starch and so it is frequently employed to excess. If used at every meal it will eventually lead to digestive disturbances so it is wise to omit starchy foods at one meal each day, so as to reduce the overall amount consumed in the twenty-four hours. If a meal consists of meat and leafy vegetables with apples as a dessert starch can be omitted completely, thus keeping it completely away from protein.

Wholemeal toast is better than oatmeal for breakfast, especially if celery or raw greenstuff is added to enforce mastication, thus allowing starch to be used without protein. Bacon, if liked, grilled and used on toast gives a good combination of starch and fat, and is better for the digestive processes than eggs and marmalade, although the combination is not an ideal one.

Starch food can be combined with raw salads or steamed vegetables with advantage. Likewise toast, butter and salad, or baked potatoes with butter and salad, and so on, in similar groupings but should they cause digestive disturbances it is an indication that a more rigid dietary control is necessary.

Starch is obtained from the cereals wheat, rye, barley, oats and rice; vegetables including potatoes and parsnips, and the form used most widely is perhaps bread from wheat flour.

Bread making has changed tremendously with the years and in the common present form, made for palatability and easy cutting, has lost a good deal of its food value, but the starch content remains predominant, contributing very frequently to nutritional deficiency. The bowel stimulus created by the bran in wholemeal bread is absent in the present-day popular white bread, and it is also deprived of the essential vitamins by modern processing.

Pure medium stone ground whole wheat flour is the best medium for bread making, as it contains all the effective and valuable elements of the wheat berry. Still, even wholemeal bread should be used in proper food combinations and not to excess, otherwise it can also contribute to dietetic errors.

The potato is a valuable food with a high starch content but mineral salts are part of its natural make-up. When peeled prior to boiling it loses many of its salts and becomes more or less a useless food, filling it is true, but not nutritious. Baked or cooked in its jacket it remains a valuable food, and because of its alkalinity when prepared thus, is more suitable for use with meat proteins than the cereal starches present in bread and so forth, but it should not be used at every meal because of its heavy starch content.

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