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METHOD OF PRODUCING FOOD STUFFS

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By comminuting different products of the soil (grains, seeds, nuts, tubers and roots) food stuffs in a general sense are produced.

The said food stuffs generally are of a one-sided composition and have their own peculiar properties, for which reason efforts are made to improve the finished product by special mixing and/or elaborating processes.

Generally speaking the treatment of the said products of the soil is directed in the first place to the most valuable and readily obtainable substances; at the same time it is tried to recover by-products.

By this separation from very complicated first materials, the drawback of one-sidedness mostly remains and the novel basic idea is to obtain in a simple manner by working together several of the said first materials those food stuffs which are most desirable considered from a technical and economical point of view.

The above mentioned products of the soil are often very different with regard to their moisture content and this may be used in practice.

The potato and the sugar beet for example are first materials of very different compositions.

An average analysis of the said products will show for the potato: about 77% of water, about 17% of starch, about 2% of albuminous substances (nitrogenous compound N x 6.25), about 1.5% of rough fibre (cellulose), about 1.3% of mineral substances, about 1% of sugar, about 0.2% of fatty substances; for the sugar beet: about 76% of water, about 17% of sugar, about 4.1% of starch substances, about 1.5% of fibre, about 1.3% of albuminous substances, about 0.1% of fatty substances.

Up to the present the potato industry has chiefly been limited to the production of starch, which used to be employed mainly for technical purposes and to a lesser extent for food stuffs. Next to the manufacture of starch potato flakes, rolled potato flour (German "Kartoffelwalzmehl"), potato baking flour and the like are produced while finally the fibrous waste was sold as a more or less inferior cattle food, mainly in a wet condition and to a lesser extent as a dry product.

As shown by the analyses, the potato contains a proportion of albuminous substances which is considerable with regard to its starch content, but up to the present it has been difficult from an economical point of view to recover the said albuminous substances and to make it profitable.

A certain similarity exists between the above mentioned treatment of potatoes and the sugar industry which in the first place has the object of producing sugar in a more or less pure form.

The sugar industry also has various waste products which are used for nutritive purposes, such as e. g. molasses, sugar pulp, dried waste pulp and wet pulp.

The nutritive value or the starch value for potato pulp and for beet pulp is low, the official figures being 0.4 for waste potato fibres and 6.5 for waste beet pulp.

The average analysis of waste potato fibre is approximately as follows: about 86% of water, about 5% of starch, about 7.7% of fibre, about 0.8% of albuminous substances, about 0.4% of mineral substances, about 0.1% of fatty substances, whereas beet pulp on the average is of the following composition: about 93% of water, about 4.7% of carbohydrates, about 0.6% of albuminous matter, about 1.4% of fibre, about 0.3% of mineral substances.

The molasses and the sugar pulp, however, are not to be considered as waste products, but more as by-products and the position is similar in the potato flour industry where the potato fibre, the starch and the albuminous substances during the working process will appear in different stages of the process with a different nutritive value.

The present invention relates to a process which makes it possible to utilize the fibrous pulp of the potato flour industry (in different stages) for efficiently producing food stuffs, both for human and for animal consumption.

The wet paste formed by the well known grinding processes of the potatoes, still contains all the constituents of the potato and accordingly has the same composition. In this mass which is semi fluid on account of its high water content the starch and the fibrous material are present in undissolved condition, whereas the albuminous matter, sugar, mineral substances and fatty substances are in dissolved condition. As soon as the said liquid constituents have been more or less removed in some manner, e. g by centrifuging or by pressing, sieving, washing, etc., or by a combination of these processes, the fibrous mass obtained thereby will immediately be able to absorb other wet materials.

The primary wet paste will contain free starch, i. e. starch adapted to be washed out, and also starch surrounded by fibres, i. e. bound starch, the proportion of which varies in accordance with the opening of the cells which consist of fibrous material.

It is of course, also possible to separate during the said process the starch capable of being washed out. The capillary action of the fibre

cells in the fibrous pulp even causes liquids to be absorbed from wet materials, whereby the said materials may easily be subjected to further desired treatments. The fibrous cells from which the substances present have been extracted to a greater or lesser degree will therefore act as moisture absorbing agents and furthermore as carriers for other masses diffcult to handle which will be mentioned hereinafter so that novel and absolutely homogeneous food stuffs are formed, and at the same time the production thereof is very much simplified and a great deal of expense is saved.

According to the invention the cellulose material is made to absorb other comminuted substances such as e. g. ground sugar beets, beets which are generally used as a cattle food (German "Frutterrüben") and other products of the soil, even comminuted green fodders. The purpose now is to grind simultaneously with the above mentioned industrial treatment of potatoes, other products e. g. sugar beets, by means of the same apparatus and to conduct the beet pulp thus formed to the carrier prepared for that purpose. This has the advantage that there is no need of losing any constituents out of the ground beets. If desired, it is possible to control the proportion and the quality of the carrier and of the material to be combined therewith in such a way that the former is adapted not only to absorb the entire beet mass as described above, but also other substances valuable as food materials, e. g. the albumen of the potato.

The concentration of the albuminous substances from the potato juice as is well known, is rather easy. Preserving and drying, however, present serious difficulties. According to the method claimed, however, there will not be any trouble, not even if considerable percentages of substances are to be absorbed. After the constituents of the novel food product to be produced have been brought into intimate contact with each other, whereby a new homogeneous matterial is obtained, the said material is dried at once by means of a suitable drying device. The said homogeneous substance thus produced constitutes a porous mass adapted to be divided in any particular condition for the drying process suited therefor. Another property of the said mass is that it will easily lose water during drying.

The drying process may be carried out either by means of open, direct heating, or in rapidly circulating air at a high temperature, or in a vacuum drier, or on a cylinder. The choice of the drier will naturally influence the properties of the finished food material. Care should be taken to remain within the limits of the moisture norms required by the technics of drying. The drying process may purposely be carried out in such a way that the products obtained will have special characteristics, e. g. by chemically modifying the starch, by binding the albumens or by converting sugar into invert sugar.

With regard to what has been stated above concerning green fodder it is still to be observed that it is possible to use the whole beets i. e. together with their tops and leaves, after having cleaned them thoroughly. The beet leaves per se may thus be utilized.

An analysis of a beet leaf will show valuable components viz.: about 84% of water, about 7.4% of starch substance, about 4.3% of mineral substances, about 2.3% of albuminous matter, about 1.6% of cellulosic material, about 0.4% of fatty substances.

This latter possibility is of great economic significance, because although the beet top and the leaf are used as cattle food, they are only of slight value until now and there is a considerable loss. Moreover by using the beets in the above manner a great deal of labour is saved in the gathering of the beets.

The novel food products may be manufactured in any desired form, e. g. in the shape of flour, granules, lumps or briquettes. This latter form has the advantage that because of the characteristic properties of the product there will be no need of binding agents.

The food products thus obtained are of a very pure and pleasant taste.

When used as a cattle food, the product is liked by the animals while both the nutritive value and the digestibility of the product can be perfectly controlled.

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