Published May 18, 1943 Serial No. 367,299

ALIEN PROPERTY CUSTODIAN

PROCESS OF PRODUCING BIOS- AND ALBUMEN-PREPARATIONS

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No Drawing. Application filed November 26, 1940

It is already known to exercise an intensifying effect upon fermentation, especially upon yeast fermentation in the case of carbohydrates, by alcoholic extracts from germ- (embryonic) parts of vegetable seeds and also from any products resulting from the processing of seeds and fruits, e. g. bran of germs, and containing germs (embryonic parts).

A process is, moreover, known of accelerating the growth of yeast in the preparation of compressed yeast by admixing substances containing completines, when using a nutritive solution poor in completines of the fission of cells, characterised in that the optimal quantity in the case of a given nutritive solution, and the concentration of the substance to be admixed respectively, are determined by way of a previous test.

It has now been found that Bios and albumen preparations of high quality can be obtained by the saccharification of vegetable substances rich in starch and albumin, e. g. oleagineous fruits, resting germs from vegetable seeds (germs of wheat, rye, maize and the like), and the residues left after pressing or extraction in the process of oil preparation, after the cellular structure has been previously broken up by steaming, preferably at an increased pressure, or in vacuo, or by colloidisation, and the like, e. g. by the encymatic method. The saccharification can, in the place of the encymatic method, also be brought about chemically, e. g. by a mineral acid, and the preceding treatment with steam be carried out in such a way that the dextrination of the starch contained in the original material is carried out under pressure, or in vacuo. The substances dissolved in water, such as the sugar formed from starch, Bios, albumin, mineral salts and other concomitant substances, are separated out by decantation, filtration or centrifugation, and are boiled down in vacuo, after they have been previously acidified with lactic acid bacteria, if necessary, (in order to increase the durability and to improve the clarification of the solution).

The inspissation of the solution rich in Bios is preferably performed in a vacuum circulation-evaporator, the interior surface of which is coated with glass-enamel, adsorbents and the like being added in order to decolorise the aqueous extract. The technical Bios concentrate thereby obtained shows qualities similar to those of malt extract. The optimal effect of the preparation is preferably to be ascertained under the Enders and Hegendörfer method, Biochem. Zeitschrift 298, 16 (1938), for which test certain races of yeast, which are poor in bios, are used as a comparative test, and nepholometry is made use of.

The insoluble residue chiefly consisting of albumin and in certain cases lipoids, is washed so as to become free of sugar, after having been separated out, and is then dried, after substances (as for instance ammonia, tartar, sodium bicarbonate, and the like), which improve the effervescence and fermentation power pigments (egg colours), substances correcting the odour and flavour (Vanilline, kitchen salt, etc.) have been added, this drying process preferably to be carried out in an atomization-dryer. If substances containing lipoids (fatty ingredients) are used as primary substances, the powder obtained will be highly similar to dried natural fowl's eggs, whereas primary substances free of lipoids (ingredients free of fat) and containing albumin and starch, will supply a substance adapted to use as a substitute of ovalbumen. The albumin preparation will help to save real hen's eggs in bakeries, confectioner's plants, biscuit and chocolate factories and for household purposes.

The substances activating fermentation which are obtained under the processes known up till now, will never be exactly defined, whereas the products prepared in accordance with the process under the present invention will be biologically tested preparations defined by the term "Bios".

The new process is simple and can also be practised at a larger scale and for technical purposes.

Examples

(1) 100 kg of wheat germ cake are extracted with benzene and finely ground. The powder of wheat germ cake shows about the following composition:

	Per cent
Water	9.81
Protein	29.68
Fat	1.49
Extract substances free of nitrogen	52.02
Raw fibre	2.52
Mineral substances	4.48

After separation of the bran components the powder is prepared by stirring it upon admixture of 3 to 4 times as much of water, and heated for one hour up to 100 centigrades, steam being fed thereto. After having been cooled down to 55–60 centigrades, the quantity of diastase required for the saccharification of the starch contained in the quantity of wheat germ cake concerned is added as an extract of green malt prepared by way of extraction of crushed green malt with a

quantity of water being three to four times as great, whereupon the mash is for four hours kept at the temperature (55 to 60 centigrades) necessary for saccharification. After the saccharification has been completed, the sugar solution is separated by decantation, filtration or centrifugation from the material which is new free of starch. After having been acidified with lactic acid bacteria, if necessary, the solution is concentrated in vacuo so as to have the consistency of sirup. This sirup will contain 43% of sugar, 5% of ashes and 7.5% of albumin, reduced to dried substance, and shows an optimal Bios effect, if 1 to 5% of it,—as compared with the quantity of pitching yeast—are used. The powder free of starch which will be left after separation of the sugar solution, is dried by way of atomization, after having been thoroughly washed with water. The composition of this atomized powder is approximately the following:

	Per cent
Protein	70
Sugar	8
Ashes	3
Water	6
Extract substances free of nitrogen	13

This powder, which is rich in albumin, can be used as a substitute of dried albumen of fowl's eggs, after having been treated with ammonia and tartaric acid, if necessary, in order to improve its effervescing capacity.

(2) 100 kg of wheat germ cake having about the following composition:

	Per cent
Water	12.69
Protein	27.82
Fat	5.08
Extract substances free of nitrogen	47.75
Raw fibre	2.41
Mineral substances	4.25

are in a colloidal vibration-mill ground down to colloidal fineness with about three to four times as much of cold water, are then presaccharified with the quantity of diastase contained in the quantity of wheat germ cake concerned (about 100 to 250 D. K.) at a temperature of 40° to 50° centigrades, whereupon they are further saccharified at 50° to 60° centigrades by an admixture of 0.7% of "Tectil" malt extract with 12000 D. K., until the iodine-starch reaction shows a negative result. After separation and evaporation of the sugar solution one will obtain about 60 kg of extract, representing the desired Bios concentrate. The optimal effect of this extract is similar to that of the Bios preparation made in accordance with example 1.). 0.08% of egg colour, 1% of kitchen salt and 0.3% of vanillin are admixed to the saccharified powder, which is then atomized in a drying tower. The powder thus obtained shows about the following composition:

	Per cent
Albumen	50
Fat	10
Ashes	6
Sugar	8
Water	10
Extract substances free of albumen	16

As the composition of this powder is similar to that of dried real hen's eggs, it can be used as a vegetable dried natural egg substance.

The Bios preparations made under the new process are excellently adapted to be used for fermentation purposes.

So, for instance, the technical Bios concentrate, can be used advantageously for baking purposes, both for dough fermented with leaven and dough fermented with yeast. The quantities of Bios contained in the extract render a considerable reduction of the fermenting period possible in particular during the last period of the dough's fermentation, this reduction resulting in savings with regard to both heat and working time. The reduction in time required for fermentation will in certain cases cause a reduced decomposition of the gluten by proteolytic enzymes, but this can easily be made up for by mechanico-dynamic swelling. The fermentation of the dough will furthermore also be expedited by the high percentages of sugar and albumin substances contained in the Bios preparation. One will, more particularly, proceed in such a way that those quantities of Bios concentrate, as will be shown by the result of the test to be necessary for an optimum of yeast fermentation, are added to the dough water. This quantity will be from 1.5 to 3 percent.

In the brewing industry a delayed fermentation causing an increase of the danger that an infection of the yeast is brought about, will easily take place, in particular in such cases, where, as customary abroad, the malt to be used has been eked out by means of malted maize and rice and the like materials. If the Bios preparation made under the new process is admixed to the fermentative mixture prepared, a quicker course of the fermentation process is brought about, and an infection of the yeast prevented.

In distillery plants (cereal grains, whisky, gentian distilleries, etc.) the use of the new Bios preparation offers great advantages due to an increase in efficiency of the already existing fermentation equipment. By the reduction of the time required for fermentation, which is brought about in such a way, the output of these plants can be very considerably increased.

Particular advantages are implied in the use of the Bios preparation for purposes of the yeast industry, where in addition to the reduction of the time required for a correct fermentation process an increased yield is also brought about. One will, moreover, be successful in preparing yeast on the basis of molasses, such yeast being perfectly equal to grain yeast of the highest quality.

In all of these processes the use of such Bios preparations, as have been made under the new process, will involve great economical advantages. In consequence of the shortened fermentative period, the expenses for power and working time will be reduced, whereas it will be possible at the same time to increase the output. Such yeast, to which Bios has been admixed, will, moreover, show a better capacity of resistance to the danger of infection, as compared with a yeast poor in Bios. These facts clearly establish the advantages involved in the use of Bios by such industrial branches, as avail themselves of processes of fermentation.

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