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(72) Inventeur/Inventor:
SOMLYAI, GABOR, HU

(73) Propriétaire/Owner:
HYD KUTATO-FEJLESZTO KTF., HU

(74) Agent: FETHERSTONHAUGH & CO.

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(54) Title: FOOD PRODUCTS FOR PREVENTING DEVELOPMENT OF DISEASES AND PROCESS FOR PREPARING SAME

(57) Abrégé/Abstract:
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(71) Applicant *(for all designated States except US)*: HYD KUTATÓ-FEJLESZTŐ KTF. [HU/HU]; Deák Ferenc u. 51/a, H-1215 Budapest (HU).

(71)(72) Applicant and Inventor: SOMLYAI, Gábor [HU/HU]; Deák Ferenc u. 51/a, H-1215 Budapest (HU).

(74) Agent: DANUBIA; Bajcsy-Zsilinszky ut 16., H-1051 Budapest (HU).

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(57) Abstract

The invention relates to a process for producing food products for the prevention of diseases, in which the deuterium content of water is reduced to 111-135 ppm by standard electrolysis and/or distillation methods, and the water thus obtained is used as nutrient solution in algae production or for irrigation of plants used in the food industry, whereby algae and plants with lower D content are obtained or the water with 111-135 ppm D content is used in the production of soft drinks and beer.

Food products for preventing development of diseases and process for preparing same

The invention relates to food products which prevent the development of diseases. Furthermore, the invention relates to a process for preparing these products.

It is known that in human organism from the moment of conception up to the date of death 10^{16} cell divisions take place. The cell division is preceded by the doubling of genetic information, DNA. The enzymes responsible for the DNA synthesis copy with 10^{-6} probability one code with defect, resulting in a gene which is different from the original one (mutant). In most cases that "mistake" creates no problem for the cells. However, when these mutations occur on certain points of the genes which play a central role in the regulation of cell division, as a consequence of the change in the genetic code shortly yet another doubling of the defective cell occurs and the process continues whereby a group of cell develops which outgrow neighbouring cells. If the organism does not recognize in time the rapidly multiplying cells, the process can lead to the development of a malignant tumour.

It takes years for a tumour to develop. According to current test methods it takes 4-5 years for one malignant cell to develop into a tumour of 1 cm diameter, for one cell to multiply into one hundred million. During that period malignant cells have enough time to scatter all through the organism and start developing other tumours as well. The reasons for the modest results achieved in the struggle against tumours include the fact that by the time the tumour is diagnosed in a body the malignant cells may be present throughout the organism.

For a long time the defense mechanism of the organism is able to maintain a balance with the continuously emerging tumour cells.

The probability for the balance to turn over is growing with the age of a person. The balance may be turned up and the tumour may develop due to a long-lasting disease which keeps the immune system engaged, or a long-term stress situation may also make it easier for the damaging effects of the so-called civilised society (smoking, nitrate-containing drinking water, polluted air, etc.) to take their toll. People who are affected with all the above effects are more likely to become victim of malignant tumour.

On the other hand, there are effects which are unfavourable for the development of tumours. For instance it has been observed that a mother of three children is less likely to develop breast tumour than a mother of two children, or one with a single child or a women who is childless. That is explained by the fact that the hormone effects accompanying three pregnancies reduce the chance for the development of malignant breast tumour.

These observations draw attention to the possibility of developing conditions which are unfavourable for tumour cells carrying mutation, and thus they can be eliminated. By cure-like treatment it is possible for the human organism to defend itself from tumour development before the tumour reaches a size in which it can already be detected.

The aim of the present invention is to produce food products which make it possible to prevent the development of tumoral diseases by eliminating tumours of as yet undetectable size through changes taking place in the organism.

The invention is based on the recognition that, depending on the climate, the D concentration of water containing 140 - 155 ppm deuterium or of plants grown with the use of water of such D content is a precondition for the maintenance of normal cell multiplication. We have rerecognized that the D concentration

relative to H concentration as an element of a sub-molecular system initiates cell division through the increase of D concentration in relation to that of H. The D entering the organism is especially indispensable for the rapidly multiplying tumour cells.

Another basis of the invention is the recognition that D-depleted water, solutions and foods can stop the division of tumour cells by reducing the D content of the organism, and thus they can also prevent the development of tumours and can cure tumoral diseases.

Based on the above the invention is a process for producing food products with 111-135 ppm D content, suitable to prevent the development of tumoral diseases, which comprises producing water with 111-135 ppm D content by standard electrolysis and/or distillation methods and using the water thus obtained

for the production of soft drinks and beer, using the standard production process or

as a nutrient solution in algae production or for irrigation of plants used in the food industry, whereby algae and plants with lower D content are obtained which are worked up in the usual way to food products.

According to one aspect of the present invention, there is provided a food product with a deuterium concentration of from 111 ppm to 135 ppm for preventing development of a tumorous disease, wherein the food product is selected from foods of a water base and foods produced or prepared using water.

According to another aspect of the present invention, there is provided a food product as described

herein, wherein the foods of the water base are selected from carbonated and non-carbonated drinking water, flavoured drinking water, beer and soft drinks.

According to still another aspect of the present invention, there is provided a food product as described herein, wherein the foods produced or prepared using water are selected from green vegetables, algae extracts and products prepared by fermentation.

According to yet another aspect of the present invention, there is provided a process for preparation of a food product wherein the food product is selected from carbonated and non-carbonated drinking water, flavoured drinking water, beer and soft drinks, comprising incorporating water with 111 to 135 ppm deuterium content produced by one or both of electrolysis and distillation into the food product.

According to a further aspect of the present invention, there is provided a process for preparation of a food product, wherein the food product is a green vegetable, the process comprising irrigating a plant from which a vegetable crop is harvested with water having a deuterium content of 111 to 135 ppm, the water produced by one or both of electrolysis and distillation.

According to yet a further aspect of the present invention, there is provided a process for preparation of a food product, wherein the food product is an algae extract, the process comprising producing algae in a nutrient medium comprising water having a deuterium content of 111 to 135 ppm, the water produced by one or both of electrolysis and distillation, and producing an algae extract from the algae thus obtained.

The products produced by using the method according to the invention is suited to prevent the development of tumours. The reason is that the consumption of beverages and plants produced with D-depleted water will reduce the D content of the organism, slowing down the multiplication of tumoral cells which finally die off.

Experiments carried out with animals fed with D-depleted water prove the suitability of the process.

PC-3 marked human prostrate tumour was implanted in 28 CBA/Ca marked immune-suppressed mice. The treatment of 14 mice with

water of 115 ppm D content was started on day 18 after transplantation, by giving the mice such water to drink. The treatment lasted 16 days, then the mice were killed and the tumours were histologically investigated.

The speed of growth of tumoral cells was determined by the ratio of dividing and dead cells in the tumour. Such ratio is easy to determine on properly prepared histological excisions.

Monitoring the growth rate of the tumour on the test animals it could be seen that the group that was fed with D-depleted water had on the average smaller tumours than the control animals. Taking into consideration the obvious fact that the size of the tumour in the animals also depended on the size of the implanted tumours, the effect of D-depleted water was more objectively reflected by histological tests which showed that in the control group the ratio between dividing (mitotic) and dead (apoptose) cells was 3.6 : 1, as against 1.5:3 observed with animals fed with D-depleted water.

Solutions with curative effect of the food industry are produced from raw materials normally used for the manufacture of fruit juices, syrups, soft drinks and beer by mixing the active agent with these raw materials. The processing of algae, vegetables and fruits grown with the use of D-depleted water is also performed by standard methods.

It is favourable to consume food products of the invention every 1-2 years for 1-3 weeks each time. During the cure it is suitable to consume exclusively plants produced with the use of D-depleted water.

The main advantages of the process according to the invention are as follows:

a) It renders possible to intervene in the cell division regulation mechanism through the same mechanism as that by which cell division itself is regulated.

b) It renders possible to prevent the development of tumours by creating unfavourable conditions for the multiplication of tumoral cells whereby the organism becomes able to eliminate the development of future tumours.

c) The compounds used in the process have no toxic side-effects.

d) No harmful waste arises during the producing process.

e) The products are easy to produce.

f) As the active agent is not mutagenic, no mutant cells develop in the course of the treatment, in contrast to most of the cytotoxins used so far that are very mutagenic and often lead to the development of even further tumours.

The invention is further illustrated by the following non-limiting examples.

Example 1

Production of D-depleted water using electrolysis

15-20 % aqueous KOH solution is electrolysed with 2-5 V voltage direct current, with a cathode separated from the anode. The hydrogen with lower D content developing on the cathode is burned and the thus-developing water vapour is condensed by a distillation system and collected separately. The D concentration of the water

thus obtained is 30 - 40 ppm. This water is mixed with normal water of 150 ppm D concentration in such a ratio that D-depleted water with D content between 111 and 135 ppm is obtained.

The product can be directly used for preventing the development of tumoral diseases or as raw material for the production of compounds with lower D content.

Example 2
Production of D-depleted water by distillation

Distilled water is boiled at 45- 50 ^{o} C in a distilling tower with 30-50 plates used for fractional distillation under 50 - 60 mbar pressure. During distillation reflux value is 12-13 , sludging in the kettle is 10-fold. By using such parameters the D concentration of the heads is between 20 and 30 ppm. By increasing the number of plates the D content of the water can be further reduced to 1 - 10 ppm. By mixing the water thus produced with normal water of 150 ppm D content, water with any D concentration between 111 and 135 ppm can be obtained.

Example 3
Production of fruit juices and carbonated soft drinks with lower D content

By mixing the distilled water of 20 - 30 ppm D content in adequate proportion with normal water of 150 ppm D content, water with 111- 135 ppm D content is produced. This water is used in the usual way for producing fruit juices and carbonated soft drinks.

Example 4
Production of beer with lower D content

The barley used for malt production is soaked in water with D content between 111 and 135 ppm , then it is spread to form a 5 - 15 cm thick layer and germinated at low (5 - 15 ^{o} C) temperature and good ventilation. Germinated barley is dried at a temperature between 50 and 75 ^{o}C , freed from the remnants of the germ-roots and milled. Milled malt is mixed with adequate quantity of water of D concentration between 110 and 135 ppm and the mixture is kept at a temperature of 50 - 75 ^{o}C, then filtered and boiled with hop. The beer wort is filtered, cooled and inoculated with pre-grown Saccharomyces cerevisiae . The main fermentation takes place at 5 - 6 ^{o}C for 10-14 days, then post-fermentation is carried out for several weeks at 0 ^{o}C in airtight barrels. Finally the thus produced beer is filtered, bottled and pasteurised. The D content of the beer depends primarily on the D content of the water used in the manufacturing process, and that affects also the D content of ethanol and other components .

Example 5
Production of food with high protein and low D content in algae culture

Chlorella vulgaris is cultured by continuously bubbling a gas mixture of 95 % by volume of air and 5% by volume of CO_2 through a nutrient liquid of the following composition: 5 g/l of KNO_3; 1.25 g/l of KH_2PO_4; 2.5 g/l of $MgSO_4x7H_2O$; 3 mg/l of $FeSO_4$ x$7H_2O$ and 1 ml/l of Arnon A-5 solution (0,6 ml/l of 0,4 % tartaric acid; 2.86 g/l of H_3BO_3; 1.81 g/l of $MnCl_2$ x 4 H_2O; 0.08 g/l of $CuSO_4$ x 5 H_2O; 0.22 g/l of $ZnSO_4$ x 7 H_2O; 0.21 g/l of Na_2MoO_4 and one drop of H_2SO_4). Water of 111-135 ppm D content is used for the preparation of the nutrient liquid. In a 200 l

size vat 1 kg of dry matter can be produced with natural light in a month.

Example 6

Production of vegetables and fruits with low D content

Vegetables and fruits are produced in the standard way in all respects, with the only difference, that water with 111-135 ppm D content is used for irrigation. During the photosynthesis the plants can build less D into the organic compounds. By consuming plants produced in this way the organism will have significantly lower D concentration, and that will inhibit the division of tumoral cells.

CLAIMS:

1. A food product with a deuterium concentration of from 111 ppm to 135 ppm for preventing development of a tumorous disease, wherein the food product is selected from foods of a water base and foods produced or prepared using water.

2. A food product according to claim 1, wherein the foods of the water base are selected from carbonated and non-carbonated drinking water, flavoured drinking water, beer and soft drinks.

3. A food product according to claim 1, wherein the foods produced or prepared using water are selected from green vegetables, algae extracts and products prepared by fermentation.

4. A process for preparation of a food product according to claim 2 comprising incorporating water with 111 to 135 ppm deuterium content produced by one or both of electrolysis and distillation into the food product.

5. A process for preparation of a food product according to claim 3, wherein the food product is the green vegetable, the process comprising irrigating a plant from which a vegetable crop is harvested with water having a deuterium content of 111 to 135 ppm, the water produced by one or both of electrolysis and distillation.

6. A process for preparation of a food product according to claim 3, wherein the food product is the algae extract, the process comprising producing algae in a nutrient medium comprising water having a deuterium content

of 111 to 135 ppm, the water produced by one or both of electrolysis and distillation, and producing an algae extract from the algae thus obtained.

FETHERSTONHAUGH & CO.
OTTAWA, CANADA
PATENT AGENTS