

similar slurry was made with the hydrolyzed cereal solids.

For the 20% coating, the hydrolyzed cereal solids and amino acid slurries were combined so as to result in a mixture in which the solids were present in the ratio of 20:80, hydrolyzed cereal solids coating material to amino acid blend. In a similar manner, combined slurries were mixed so that the solids of the coating and the amino acid mixtures were blended in ratios of 30:70 and 40:60. Each of the resulting blends was slowly fed into a commercial, steam jacketed spray drier. Both inlet and outlet temperatures were regulated in such a way as to obtain a spray dried product with a moisture content of less than 5% as determined by the Karl Fischer moisture determination method.

Each blend was mixed 50:50 (by weight) with milled dextrose (milling increased surface area so as to provide a more rigid test of the efficacy of the coating technique). One sample of each coating was aged at each of several different temperature levels ranging from 4.4° C. to 48.9° C. As a control, an uncoated amino acid mixture was combined with the same milled dextrose, 50:50, and aged at the same temperatures. A summary of results obtained with the 40:60 coating samples at three temperature levels is presented in Table III.

Results of the aging study showed that a coating of hydrolyzed cereal solids with an average D.E. of 24 can be used to reduce the rate of the Maillard reaction, at a moisture content of up to 2.4%. Based on the above data and the established relationship between D.E. number and the rate of the Maillard reaction, it is apparent that hydrolyzed cereal solids of substantially higher D.E. than 24 would result in an unacceptable rate of the Maillard reaction, although some protection might be afforded.

Table III

| Color Comparison of Coated Amino Acids* Mixed with Anhydrous Dextrose in a Ratio of 1:1 at 3 Temperatures | | | | | | | |
|---|---------------|----|----|----|----|-----|------|
| COATED AMINO ACIDS (1) | | | | | | | |
| Temp. in C.° | Aging in Days | | | | | | |
| | 0 | 11 | 56 | 63 | 98 | 161 | 196 |
| 48.9° | 0 | ++ | # | # | # | # | # |
| 38.8° | 0 | 0 | 0 | 0 | + | +++ | ++++ |
| 4.4° | 0 | 0 | 0 | 0 | 0 | 0 | + |

| UNCOATED AMINO ACIDS (2) | | | | | | | |
|--------------------------|---------------|----|------|-------|-----|-----|-----|
| Temp. in C.° | Aging in Days | | | | | | |
| | 0 | 11 | 56 | 63 | 98 | 161 | 196 |
| 48.9° | 0 | ++ | ++++ | +++++ | >5+ | >5+ | >5+ |
| 38.8° | 0 | + | +++ | +++++ | >5+ | >5+ | >5+ |
| 4.4° | 0 | 0 | 0 | 0 | + | + | + |

Key:

* = Coated with FRODEX 24, in the ratio of 60:40 amino acid to FRODEX

(1) = Moisture content 2.3%

(2) = Moisture content 0.3%

0 = No detectable color/odor change

+ = Barely detectable color/odor change

++ =

+++ = intermediate intensities of browning

++++ = and acrid odor

+++++ = Color changed to dark brown, odor acrid and pungent.

= Not analyzed.

Variations can, of course, be made without departing from the spirit and scope of the invention.

Having thus described the invention, what we desire to secure by Letters Patent and hereby claim is:

1. A non-fluid composition comprising a nitrogen compound and a carbonyl compound capable of undergoing the Maillard-type browning reaction with said nitrogen compound under ambient conditions, wherein a material consisting essentially of a starch having a DE

number of from 0 to about 24 physically separates at least a major proportion of said nitrogen compound from said carbonyl compound, whereby said Maillard reaction is prevented or substantially delayed during storage.

2. The composition of claim 1 wherein said starch is present as a coating on at least one of said nitrogen compound and said carbonyl compound.

3. The composition of claim 2 wherein said starch coats said nitrogen compound.

4. The composition of claim 3 in powder or granule form.

5. The composition of claim 2 wherein the weight ratio of said coating starch to said coated compound is between about 1:99 and 99:1.

6. The composition of claim 2 wherein the weight ratio of said coating starch to said coated compound is between about 10:90 and 50:50.

7. The composition of claim 1 wherein said starch comprises at least about 1 percent by weight of said composition.

8. The composition of claim 1 wherein said starch has a D.E. number in excess of 0.

9. The composition of claim 1 wherein said starch has a D.E. number between about 5 and about 15.

10. The composition of claim 1 wherein said starch has a D.E. number of about 10.

11. A non-fluid, synthetic dietary composition for supplying nutritional requirements comprising (1) a proteinaceous material, (2) an aldehyde group containing dietary compound, and (3) a starch, wherein the Maillard reaction between said proteinaceous material and said aldehyde compound is prevented or substantially retarded during storage of said composition by virtue of at least a major proportion of at least one reactant selected from the group consisting of said proteinaceous material and said aldehyde compound being coated with a material consisting essentially of at least a portion of said starch, the starch used for said coating having a D.E. number of between 0 and about 24.

12. The composition of claim 11 in powder or granule form.

13. The composition of claim 11 wherein said proteinaceous material is coated with said starch.

14. The composition of claim 11 which has a moisture content not in excess of about 8 percent by weight.

15. The composition of claim 11 which has a moisture content not in excess of about 5 percent by weight.

16. The composition of claim 13 wherein the weight ratio of said coating starch to said coated compound is between about 1:99 and 99:1.

17. The composition of claim 16 wherein the weight ratio of said coating starch to said coated compound is between about 10:90 and 50:50.

18. The composition of claim 17 wherein said starch has a D.E. number in excess of 0.

19. The composition of claim 18 wherein said starch has a D.E. number between about 5 and about 15.

20. The composition of claim 19 wherein said starch has a D.E. number of about 10.

21. The composition of claim 13 wherein said proteinaceous material is selected from the group consisting of the individual amino acids, the proteins and the peptides.

22. The composition of claim 21 which comprises at least one essential amino acid.