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Diabetic Foods.

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THE VALUE OF SO-CALLED DIABETIC FOODS.¹

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It is not my intention to attempt in any way to discuss the etiology or pathology of diabetes mellitus, a disease little understood even by those of large clinical experience, but to confine myself strictly to a consideration of certain foods, which are recommended as valuable in the diabetic dietary. It is, I believe, undisputed, that a most important point in the treatment of the disease is the more or less complete elimination of sugar and starch from the diet, and it is a natural corollary that the ingestion of these substances except in very small amounts, is often equivalent to the administration of a poison. This deprivation is borne with great difficulty by the average patient, and consequently substitutes for the carbo-hydrates have been sought for, to satisfy the intense craving for the forbidden articles of food.

Glycerine and the recently discovered saccharin are said to satisfy in a measure the longing for sweets, but a perfectly satisfactory harmless substitute for

¹ Read at the Boston Society for Medical Improvement, February 27, 1888.



starch has been more difficult of attainment. Various diabetic flours and biscuits have been prepared, and are widely advertised as being non-starchy, and as giving complete satisfaction to the patient. Having examined occasional specimens of biscuits and bread made from these flours, brought me by physicians, and having never obtained any very satisfactory evidence of their value, I determined to secure as many different diabetic foods as possible, analyze them, and report the results, good or bad, to the profession. I have succeeded in obtaining eleven different kinds of flour and biscuit, advertised or recommended as substitutes for starchy foods. I have examined them, and have now the honor to report the results to the Society. The foods, the claims that are made for them, and the results of examination, are as follows:

(1) **Gluten Flour:** Farwell & Rhines, Watertown, N. Y. This and the next-mentioned are quite extensively advertised as particularly adapted to the dietary of diabetics and dyspeptics. The circulars describe it as "substantially free from starch which is like poison to the diabetic, and produces acidity, flatulence, and indigestion in dyspeptics." "It is as nearly free from starch as practicable to make a flour suited to general daily use." "The majority of diabetics find it just

what they need." Examination shows moisture (at 100° C) = 8.69%, starch = 67.17%, which will produce sugar = 74.63%. A bread of this flour with the usual amount of moisture would contain over 30% of starch, or the equivalent of 35% of sugar.

(2) Special Diabetic Food: Farwell & Rhines, Watertown, New York. This, according to the circular "is a flour for extreme cases of diabetes, a more crude gluten, pronounced by the highest authority to contain much less starch than the gluten imported from Paris at great cost." "As a diabetic flour it defies competition in this country or Europe." "Beware of hurtful imitations." The name of the "highest authority" is not given, neither is the amount of starch in the foreign gluten with which the comparison is made. Moisture = 8.10%, starch = 68.18%, which will produce sugar = 75.76%. Its bread would contain about 36% of starch, which would produce 40% of sugar.

(3) Health Flour. This brand was recommended very highly as a diabetic flour by a wholesaler, who claimed for it a great superiority over all others. It is not, I understand, very extensively advertised. Moisture = 8.03%, starch = 72.00%, which will produce sugar = 80.00%. Its bread would contain

about 40% of starch, which would yield over 44% of sugar.

(4) Gluten Flour. New York Health Food Company. The company assert that "the foreign glutens are found to contain a larger percentage of starch;" that "the glutens offered by many millers, bakers and dealers, is simply ground bran and impure middlings, a sort of fine feed or offal of very small nutritive value aside from the liberal percentage of starch and the trifling proportion of gluten which it contains." It is further asserted that "the gluten manufactured by the Health Food Company is commended by the medical faculty as almost the only allowable and palatable bread food for the diabetic." Examination shows moisture = 9.30%, starch 66.18%, which will yield sugar = 73.53%. Its bread would contain about 35% of starch, which would produce about 39% of sugar.

(5) Gluten Wafers (plain). These were purchased at the agency of the same company and were guaranteed by the salesman to contain no starch, or at most, only the merest accidental trace. The same guarantee was given for the Gluten Flour (No. 4), and for No. 6. Moisture = 8.10%, starch = 66.96%, which will yield sugar = 74.40%.

(6) Gluten Wafers (butter). These biscuits were

represented as similar to No. 5, with the exception that they are made with butter, which proved to be the case. They are much more palatable than the plain biscuits. Moisture = 7.74%, butter — not estimated, starch = 51.14%, which will yield sugar = 56.82%.

(7) Dr. Johnson's Educators. These biscuits are recommended very strongly by the seller, who assured me that they are absolutely free from starch. Moisture = 5.44%, starch = 71.43%, which will yield sugar = 79.37%.

(8) Boston Health Food Company's Diabetic Flour. No. 1. This flour and the next succeeding, (No. 9), were sold as absolutely non-starchy, and in every way superior to all others for diabetics. Examination shows moisture = 8.13%, starch = 62.94%, which will yield sugar = 69.93%. Its bread would contain about 30% of starch, or the equivalent of 33.33% of sugar.

(9) Diabetic Flour, No. 2, (same company). Moisture = 7.66%, starch = 54.88%, which will produce sugar = 60.98%. Its bread would contain about 23% of starch, or the equivalent of 25.55% of sugar.

(10) Flour of Bran. This is sold as a pure bran flour devoid of starch and very valuable as a food.

Examination shows it to be as nearly free from starch as possible, there being but a mere trace present. It seems to be a finely-ground washed bran. As to the claim that it is of value as a food, it may be said to be about as nutritious and palatable as exhausted sawdust.

(11) Carlsbad Wafers. These, I am informed by one of our prominent practitioners, are held in high favor by ladies of gouty diathesis, diabetics, and persons avoiding sugar on account of increasing portliness, by reason of a popular idea that they are made of white of egg and glycerine, to the latter of which ingredients they are supposed to owe their sweet taste. I very much doubt that a wafer of this degree of dryness could be made of these two substances, and I do not know that the manufacturers claim that they are so made, or that they are free from carbo-hydrates. However that may be, it is very easy to demonstrate that sugar enters very largely into their composition. They are made in three thin layers, the middle one consisting wholly of white sugar.

For purposes of comparison I have made three additional examinations of bread foods of acknowledged richness in starch, in order to determine whether it would not be as well, or better, in case a bread or

biscuit must be given to satisfy the craving for starch, to allow a small amount of palatable ordinary bread or biscuit daily, rather than the more or less unpalatable and fraudulent substitutes.

As a fair example of palatable crackers, I chose Graham Wafers; the other bread foods were ordinary home-made white bread, and corn-cake made with "white meal." Graham Wafer, moisture = 3.94%, starch = 58.45%, (sugar = 64.94%).

Compared with the diabetic biscuits above mentioned, the Graham Wafer may be almost regarded as a superior form of diabetic food. It contains a smaller percentage of starch than the Educator with its 71.43% and the Gluten Wafer (plain) with its 66.96%, and but little more than the Gluten Wafer (butter) with its 51.14%. It is in addition a remarkably palatable food, while the other three are anything but pleasant to the taste, according to my own view and that of others who have tried them at my request. Moreover, the Graham Wafer is honest, while the others are fraudulent.

Home-made Bread, moisture = 37.25%, starch = 44.99%, (sugar = 49.55%). Corn Cake (white meal), moisture = 44.62%, starch = 38.04%, (sugar = 42.37%).

In making my estimates of the amount of starch in

breads made with the diabetic flours, I have supposed them to contain about the usual 40% (or thereabouts) of moisture. Comparing the estimated figures with the amounts of starch in the two ordinary breads, it is observed that the difference in percentage of starch is but slightly in favor of the diabetic breads, whereas according to the claims made by the manufacturers and retailers, it should be overwhelming. But the item of palatability is something to be considered, and the slight difference in the percentage of starch might well be waived in its favor.

There is another and more serious side to this question of diabetic foods. That they are in the highest degree fraudulent has been proved. They are in addition a positive danger, for the diabetic accepting as truth the assertions that they are non-starchy, takes unconsciously into his system a large amount of that which even the circulars of the manufacturers admit to be virtually a poison in its effect on the course of the disease, and thus innocently more than counteracts the benefit which he otherwise would derive from his medical adviser. In conclusion, I have to express the hope that every practitioner will do his utmost to discourage the use of these fraudulent and dangerous foods, and to drive them out of the market.

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