

A study of products for diabetics and weight-watchers found on the Finnish market

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Introduction

With the higher standard of living of the past few years, an increasing number of special products for diabetics and weightwatchers have become available. In them the sugar has been replaced by non-caloric or suitable energy-yielding sweeteners, or the energy content has been reduced by other means. These products are designed to take the place of food articles from which the patient would otherwise have to refrain altogether. The products cannot always be classified specifically for diabetics or for weight-watchers, since in many cases they are suitable for both groups, the diets being alike in many respects. Moreover, where diabetes is combined with overweight as it often is, the diet must be low in calories as well as sugar-free.

Since these dietetic products are still in the process of being developed, it is important that their quality and appropriateness be investigated. In the case of special products it is essential that proper information of the properties of these products be available to the consumer. Likewise it is important that regulations be developed with respect to the quality and labelling of products. The attractiveness and marketability of such goods is also worth of attention.

Material and methods

Material. For this study, all products of the type specified – mainly intended for diabetics – were taken, except, fruit preserves which were studied earlier (1), and confectionery, which forms a separate small group. In particular, all articles produced in Finland were included as well as imported articles easily available in the Helsinki area (i. e., 4 bakery products and 6 sweetening agents). The samples were collected between May and July, 1973. In addition to the dietetic products, corresponding normal (sugar-containing) products were also taken for purposes of comparison. The total number of samples was 61, of which 49 were dietetic products and 12 were control samples. The samples may be classified as follows:

1. bakery products (32 samples)
 - a) plain biscuits (5)
 - b) Marie biscuits (3)
 - c) filled biscuits (4)
 - d) fruit wafers (8)
 - e) chocolate biscuits and wafers (4)
 - f) ginger coolies (3)
 - g) zwiebacks (3)
 - h) crisps breads (2)

2. ice milks and creams (5)
3. fruit pudding powders (4)
 - a) strawberry
 - b) currant
4. orange drinks (5)
5. sweetening agents (15).

Methods. a) Chemical analyses. Moisture was assayed by the AOAC method (2) except concerning the ice creams and milks, where sea sand was added (3). Ash was assayed according to the AOAC method (4), protein according to the Kjeldahl method (5). In the calculations, the coefficient 6.38 was used for the ice creams and milks and 6.25 for all other samples. Where samples showed a high content of sugar alcohol, fat was assayed by the method of Roesse-Gottlieb (6), otherwise direct ether extraction was used (7). Carbohydrates were calculated as difference. The energy content (caloric value) (Kcal) was calculated per 100 g, using Rubner's coefficients (4.1; 9.3; 4.1). The corresponding values of the SI-system (kJ) were obtained from the caloric values by multiplication, coefficient 4.187. In addition to the ordinary assay of composition, the sugars and sugar alcohols were separately assayed as trimethylsilyl derivatives by gas chromatography according to Jones et al. (8), with slight modifications. With some orange drink samples, sugar was assayed also by the Bertrand method (9).

b) Organoleptic evaluation. Bakery products, ice milks, fruit puddings prepared according to instructions, and orange drinks were evaluated by a scoring method modified as the Karlsruhe scheme (see e. g. 10). Here the various properties were scored in the following way: colour (appearance) 0–2 points, structure (consistency) 0–4, smell 0–4, and taste 0–10. (The smell of the ice milks and consistency if the drinks were not evaluated). Samples were presented to judges as a series of 3–5 articles with one of the samples usually a control sample. The order of presentation was determined by lot; judges were not told which sample was the control.

The strength of the sweetening agents was compared with the label declaration using the paired comparison method. For this purpose, solutions were prepared from the samples so as to correspond to the normal concentrations of everyday use, and these were then compared with control solutions of sugar. Since the sweetening strength was usually given in terms of lumps of sugar, two common commercial sizes of sugar lumps were taken as standard; from the average weight of these, the sugar concentrations 3.25 g/100 ml (Pulmu sugar) and 2.85 g/100 ml (Sirkkü sugar) were chosen for comparison. Where the sweetening strength was declared in some other way, the test was redesigned accordingly.

Results

The panel consisted of 8–11 trained judges who were not regular users of the dietetic products studied.

The results, compiled in Tables 1–4, show the chemical analyses and organoleptic evaluation of the food products studied. The evaluation of the sweetening agents is presented in Table 5.

Table 1. Results of the chemical analyses and organoleptic evaluation of the bakery products

Table 2. Results of the chemical analyses and organoleptic evaluation of the ice milks

Table 3. Results of the fruit pudding powders and prepared puddings

Table 4. Results of the orange drinks

Table 5. Sweetening strength of the sweetening agents.

Comments on the results

The values obtained in the chemical analyses correspond well with the label declarations. The difference was greatest in the case of fat content, where the declared values differed from the analytically obtained ones over a range of -7.4 to $+4.7\%$. Possibly the assay method used influences the result.

In the bakery products the amount of fat and sweetener varied according to the type of product, so that filled and chocolate-containing samples had higher contents of fat and sorbitol or fructose than plain biscuits. In all bakery products the energy content was rather high and similar to sugar-containing controls. Therefore such products, intended for diabetics, are not very well suited for weight-watchers, and the consumers should carefully observe the information given on energy content so as to find the products appropriate for their purpose.

The composition of the crisp bread for diabetics was found to correspond approximately to that of the control (ordinary crisp bread produced in Finland), except in its high protein value and correspondingly low carbohydrate value. The crisp bread with milk powder added, produced in Finland, is similar in composition to the dietetic product. It would be advantageous to the consumer, however, if a declaration of nutritive value were given on the label as it is for the dietetic product. In the organoleptic evaluation the control sample was preferred.

The energy content of the ice milks for diabetics was approx. $2/3$ of that of the control sample, an ordinary ice cream. Thus these special products are also suitable for weight-watchers.

For these latter, there are also on the market ice milks, sweetened with sugar which have a similar lowered energy content. By contrast, the fruit puddings for diabetics, sweetened with sorbitol had an energy content nearly as high as the sugar-sweetened controls; such diabetic products are therefore not particularly well suited for weight-watchers.

With respect to the orange drinks, it is well known that the amounts consumed at one time may be considerable. Therefore the amount and type of the carbohydrates is important for diabetics. In samples 1 and 4, the sweetener was saccharin alone, and the energy content was correspondingly low. Also in samples 2 and 3, sweetened with fructose and sorbitol, respectively, the energy content is lower than in the control sample sweetened with ordinary sugar.

In most cases the control samples obtained slightly higher values than dietetic products in the organoleptic evaluation, differences being mainly in the taste and consistency. The differences were only small, and in a few cases the dietetic product was even considered superior to the control sample.

The typical descriptions of the dietetic biscuits have been "tasteless", "brittle", and "mealy". Likewise the ice milks and fruit puddings were commonly described as "tasteless" and the coarse and granulated texture of the ice milks was commented upon.

The complaint of tastelessness may primarily be due to the purposefully reduced sweetening of these products. Consequently the judges, being used to higher levels of sweetness, considered this a drawback, even though aware that the samples were intended for diabetics. The biscuits sweetened with fructose received a good evaluation just because of their greater sweetness and also

Results of the chemical analyses and organoleptic evaluation of the bakery products

Sample number	Chemical analyses										Organoleptic evaluation			
	Moisture %	Ash %	Protein % (6,26 xN)	Fat %	Sorbitol %	Fructose %	Total* carbo- hydrates %	Energy content Kcal/100 g	Energy content kJ/100 g	Appearance 0-2	Structure 0-4	Smell 0-4	Taste 0-10	Total 0-20
<i>Plain biscuits</i>														
1	3,8	1,5	7,2	24,6	14,9	—	62,9	516	2160	1,9	3,3	3,4	7,4	16,0
2	4,9	1,4	7,4	17,5	—	12,9	68,8	475	1989	1,9	3,7	3,6	8,5	17,7
3	4,4	1,6	8,6	15,4	—	11,4	70,0	465	1947	2,0	3,7	3,6	8,4	17,7
4**)	6,1	1,7	11,5	7,5	6,2	9,1	73,2	417	1746	—	—	—	—	—
5 c	5,3	1,2	7,1	15,0	—	—	71,4	461	1930	1,7	3,1	3,4	8,4	16,6
<i>Marie biscuits</i>														
6	2,1	1,5	7,8	9,7	19,1	—	78,9	446	1867	1,6	2,8	3,4	7,2	15,0
7	4,2	1,3	7,3	10,2	19,9	—	77,0	440	1842	1,6	2,8	3,3	7,8	16,0
8 c	2,6	1,3	8,0	9,8	—	—	78,3	445	1863	2,0	3,6	3,8	8,9	18,3
<i>Filled biscuits</i>														
9	2,8	1,0	6,1	26,8	17,0	—	63,3	534	2236	1,7	3,1	3,6	6,9	15,3
10	4,2	1,0	6,7	18,0	20,3	—	70,1	482	2018	1,8	3,1	3,5	7,1	15,5
11	3,7	0,8	6,3	23,4	20,1	—	65,8	513	2148	1,9	3,2	3,5	7,5	16,1
12 c	3,4	0,8	5,8	24,6	—	—	65,4	521	2181	2,0	3,9	3,5	8,5	17,9
<i>Fruit wafers</i>														
13	1,6	0,5	3,8	33,7	31,1	—	60,4	577	2416	1,7	3,7	3,9	8,7	18,0
14	2,8	1,3	8,1	43,5	—	15,0	44,3	619	2592	1,8	3,5	3,4	7,6	16,3
15	3,3	1,6	10,7	24,5	—	27,0	59,9	517	2165	2,0	3,9	3,6	7,8	17,3
16	3,1	0,5	5,0	26,8	31,3	—	64,6	535	2240	2,0	3,6	3,7	8,4	17,7

Table 1, continued

Sample number	Chemical analyses										Organoleptic evaluation			
	Moisture %	Ash %	Protein % (6,25 x N)	Eat %	Sorbitol %	Fructose %	Total* carbo- hydra- tes %	Energy content Kcal/ 100 g	Energy content kJ/ 100 g	Ap- pear- ance 0-2	Struc- ture 0-4	Smell 0-4	Taste 0-10	Total 0-20
17 c	3,6	0,4	5,2	22,4	—	—	68,4	510	2135	2,0	3,1	3,4	7,5	16,0
18	3,3	1,5	11,3	29,5	27,6	—	54,4	544	2278	2,0	3,6	3,0	5,8	14,4
19	1,9	0,2	2,9	38,2	28,3	—	56,8	600	2512	2,0	3,2	3,8	7,6	16,6
20 c	4,4	0,4	3,2	27,4	—	—	64,6	533	2232	1,7	4,0	4,0	8,6	18,3
<i>Chocolate biscuits and wafers</i>														
21	3,6	1,6	8,2	27,5	—	30,4	59,1	532	2227	1,9	3,5	3,6	8,1	17,1
22	3,7	1,2	7,1	21,9	19,8	—	66,1	504	2110	2,0	3,3	3,6	7,8	16,7
23	1,5	0,7	5,5	42,4	22,9	—	49,9	621	2600	2,0	3,6	3,7	8,7	18,0
24	1,4	1,2	7,2	33,3	30,7	—	56,9	573	2399	2,0	3,1	3,6	8,1	16,8
<i>Ginger cookies</i>														
25	1,6	1,5	7,9	18,1	13,3	—	70,9	491	2056	1,0	2,8	3,5	6,7	14,0
26	3,7	1,7	10,0	22,9	9,7	—	61,7	507	2123	1,5	2,7	3,4	7,2	14,8
27 c	3,7	1,3	6,6	14,4	—	—	74,0	464	1943	1,8	3,5	3,7	9,2	18,2
<i>Zwiebacks (Rusks)</i>														
28	5,4	2,6	15,3	12,2	—	—	64,5	441	1846	2,0	3,8	2,9	7,3	16,0
29	6,5	1,3	12,1	4,4	9,0	—	75,7	401	1679	1,3	3,0	3,3	7,4	15,0
30 c	5,9	1,9	13,1	8,2	—	—	70,9	421	1763	2,0	4,0	3,6	9,2	18,8
<i>Crisp breads</i>														
31	7,8	2,7	23,9	0,8	—	—	64,8	371	1553	0,8	3,3	3,5	7,0	14,6
32 c	9,5	3,6	12,6	0,5	—	—	73,8	359	1503	2,0	3,6	3,9	9,0	18,5

C = control

* = sorbitol and fructose are included in total carbohydrates

** = according to the date mark, the product had exceeded the storage life and therefore the results of the evaluation cannot be taken into account

because in other respects as well they closely resembled the sugar-sweetened controls. These fructose-sweetened biscuits were not in general declared as for special diets alone. One interesting feature: some of the judges considered the control samples too sweet. In part this may be due to the fact that in the series being judged the other samples were less, sweet, but it may also reflect a new attitude towards sweetness, which seems to be gaining ground.

The complaint that the products were "aged" was often made. As noted in an earlier paper (1), the turnover of dietetic products on the market may be exceedingly slow and the quality may suffer accordingly prior to consumption. West-Germany has legislation requiring the labels of dietetic products to carry either the date of production or the date until which the product will keep in perfect condition (11).

The sweetening strength corresponded to the declaration in most cases and in the saccharin preparations it was often even higher. With the saccharin samples there were often complaints of a bitter aftertaste, indicating that attempts to eliminate or mask the bitterness have not been successful. It may be noted, however, that such faults are most prominent when evaluation is done in plain water solution; in the actual sweetening of foods the taste factors present often serve to mask the aftertaste.

General discussion

At the present Finnish legislation has only a few regulations concerning special dietary products. According to statute 476/61 of the Ministry for Commerce and Industry (12) raw materials and additives must be declared on labels with the raw materials reported in decreasing order according to weight. The additives must be declared according to their official names in the List of Additives. Of the sweetening agents, sorbitol, fructose, saccharin, and cyclamate are allowed, according to statute 953/73 of the National Board of Trade and Consu-

Table 2
Results of the chemical analyses and organoleptic evaluation of the ice milks

Sample number	Chemical analyses										Organoleptic evaluation			
	Moisture %	Dry matter %	Ash %	Protein % (6.25 × N)	Fat %	Sorbitol %	Total* carbohydrates %	Energy content Kcal/100 g	Energy content kJ/100 g	Appearance 0-2	Structure 0-4	Taste 0-10	Total 0-20	
1	71.9	28.1	1.1	4.5	6.7	9.1	15.8	146	611	1.2	2.2	6.4	9.8	
2	73.4	26.6	1.3	8.2	4.3	5.4	12.8	126	528	1.8	3.0	7.7	12.5	
3	73.8	26.2	0.9	4.2	3.7	10.9	17.4	123	515	1.1	1.9	5.5	8.5	
4	72.1	27.9	1.1	4.7	6.6	11.9	15.5	144	603	1.2	3.9	7.8	12.9	
5	64.0	36.0	1.0	4.3	12.0	—	18.7	206	863	2.0	4.0	9.4	15.4	

* = sorbitol is included in total carbohydrates c = control

Table 3

Results of the chemical analyses and organoleptic evaluation of the fruit pudding powders and prepared puddings

Sample number	Chemical analyses							Organoleptic evaluation				
	Moisture %	Ash %	Protein % (6.25×N)	Sorbitol %	Total* carbo- hydrates %	Energy content Kcal/ 100 g	Energy content kJ/ 100 g	Colour 0-2	Struc- ture	Smell 0-4	Taste 0-10	Total 0-20
1	3,9	0,4	0,6	65,7	95,1	392	1641	1,7	3,2	1,7	5,6	12,2
2 c	2,1	0,2	0,1	—	97,6	401	1679	1,5	3,6	3,0	6,8	14,9
3	4,2	0,4	0,7	61,3	94,7	391	1637	2,0	3,5	2,0	6,2	13,7
4 c	2,2	0,3	0,4	—	97,1	400	1675	1,9	3,5	2,9	7,9	16,2

* = sorbitol is included in total carbohydrates c = control

Table 4

Results of the chemical analyses and organoleptic evaluation of the orange drinks

Sample number	Chemical analyses							Organoleptic evaluation			
	Glucose %	Fructose %	Sucrose %	Sorbitol %	Total* carbo- hydrates %	Energy content Kcal/ 100 g	Energy content kJ/ 100 g	Appear- ance 0-2	Smell 0-4	Taste 0-10	Total 0-20
1	0,05	0,38	0,03	—	0,46	2	9	1,9	3,1	6,8	11,8
2	0,12	4,80	0,19	—	5,11	21	88	1,7	3,1	6,2	11,0
3	—	0,08	—	1,71	1,79	7	29	1,9	3,1	6,8	11,8
4	0,10	0,13	0,10	—	0,33	1	4	1,7	3,2	6,0	10,9
5 c	—	—	9,00	—	9,00	37	155	1,8	3,1	7,9	12,8

* = sorbitol is included in total carbohydrates c = control

mer Interest (13). The amount of the sweetening agent must be given in per cent by weight. In the case of saccharin, the product must be declared artificially sweetened. The use of cyclamate has been forbidden during the last four years, but in the autumn of 1973 its use was again allowed in some products intended for diabetics. In the doses and label declarations the precise instructions given by the Medical Board must be followed. Sorbitol may be used as sweetener (or additive) if it is included in the List of Additives for the product in question. The maximum amount allowed is 7% (by weight), except in chewing gum, gum arabicum pills and dietetic products.

A "sugar lump cross" has been adopted in Finland as a sign that the medical council of the Finnish Diabetic Association has approved the declaration for the product in question. The sign shows that the product contains no sugar and that there is a label declaration of the nutritive value (proteins, fats, carbohydrates) and energy content per 100 g. Also the carbohydrates (sorbitol too) of the sweetener must be included in the energy content (14). A similar system of approval seems to be administered by the British Diabetic Association (15).

In the series under study only the fruit pudding powders had declarations meeting the association's requirements. However, as such declarations would be useful for the patients, the practice should be made more common. Good possibilities for this appears to exist.

The mode of declaration varied somewhat for the products studied. In the bakery products the composition (proteins, fats and carbohydrates) and energy content were usually declared per 100 g; also the amount corresponding to a "bread unit" was often given. In the case of the ice milks the energy content was given for only one sample, and the composition for none. However, all the samples were labelled as ice *milks*. On the fruit pudding powders the declarations of nutritive value, proposed by the Diabetic Association, were given per portion. Some of the labels on the orange drinks showed energy content either per 100 g or per bottle, but the amount of fructose was not declared when it had been used as sweetener.

It is an open question which type of declaration would be more practical and generally acceptable: declaration of the raw materials and additives in decreasing order according to weight, or declaration of composition and energy content. The latter, of course, is more precise and informative, but also more expensive, assuming that the declarations is based on performed analyses. Similarly it is debatable whether the values would be better given per 100 g or per unit or portion. Evidently, declaration of the type and amount of the sweetener is important, and the declaration should be such that no uncertainty remains. Difficulties have been noted already in connection with the term "sugarless", since there is an inconsistency in the meaning of the word "sugar" as used in everyday speech and in food chemistry. Also it has not yet been resolved whether sorbitol should be considered a carbohydrate. However, since it behaves metabolically in nearly the same way as fructose and has high energy content, it seems advisable to calculate it as carbohydrate, even though this is not quite correct chemically. Among others, the medical council of the Finnish Diabetic Association is of this opinion.

This study has shown that the assortment of products intended for diabetics is comparatively large. Some of these products are also suitable for weight-watchers. One general feature emerged was that many firms are producing the same types of dietetic products, thus several different producers offer vanilla-flavoured sugar-free ice milk, and sugar-free or low-calorie orange drinks, whereas other flavours are lacking. While some of the producers appear to have specialized in dietetic products (for example, nine of the bakery products studied

Sweetening strength of the sweetening agents

Comparison of the sweetening of the sweetening agents, given on the label, with that of sucrose at a concentration corresponding to one lump of sugar in 100 ml of water. The fractional numbers in the columns give the number of judges considering the sweetening agent solution sweeter against the total number of judges.

Sample	Type of sweetening agent used	Mode of presentation	I evaluation control solution: 3.25 g sucrose/100 ml	II evaluation control solution: 2.85 g sucrose/100 ml	Conclusion ¹
<i>A. Non-caloric</i>					
1	saccharin	granules	4/10	7/10	0
2	saccharin	granules	4/9	7/10	0
3	saccharin	granules	5/10	7/10	0
4	saccharin	granules	8/9	8/9	+
5	saccharin	granules	6/8	8/8	+
6	saccharin	granules	8/10	9/10	+
7	saccharin	granules	10/10	10/10	+
8	saccharin	granules	4/10	7/10	0
9	saccharin	solution	9/10	9/10	+
10	cyclamate	granules	7/10		0
<i>B. Energy-yielding</i>					
11	sorbitol + saccharin	powder	1/10		-
12	sorbitol	powder	0/10		-
13 ²	fructose	powder	0/10		-
14 ²	fructose	tablets	0/10		-
(15 = control)					

¹ 0 = approximately as sweet as the control (no significant difference)

+ = sweeter than control (at least in one of the evaluations a significant difference at the 5% level is obtained)

- = less sweet than control (at least in one of the evaluations a significant difference at the 5% level is obtained)

² Sweetening strength was not reported on the label. It was assumed to be 1.5 as compared with sucrose = 1.

were produced by one firm), other producers have the dietetic products as a small side line. As sweetening agent, the most common was sorbitol, which had been used in 17 bakery products, all ice milks and fruit puddings, and one of the orange drinks. Saccharin had been used, in addition to sorbitol, in nine biscuits and one orange drink; two orange drinks contained only saccharin as sweetener. Cyclamate was prohibited during the time the samples had been produced.

In general the products studied were found to be of good quality and appropriate for their purpose. Improvements could nevertheless be made in taste and consistency. Where sweetness must be decreased, it might be of advantage to add some other materials giving taste. Development of new biscuit recipes

so as to avoid the characteristic brittleness and mealiness would be advantageous. One drawback was that some of the products were too old and a stale taste was apparent. In this regard the improvement of packaging should be studied. Still more important would be to increase the turnover on the market and to inform interested consumers of the available products in the most effective way. Another possible solution would be either voluntary or statutory declaration of keeping time (open dating).

Since the high standard of living makes overweight and illnesses connected with it, e. g. diabetes, more common, food producers might well pay more attention to products intended for weightwatchers; such products would clearly be suitable for improving the health of consumers in general. This would imply large-scale changes in the food production, since for this purpose a general reduction in fat and sugar content is the essential requirement. On the other hand, results along the same line might be obtained by encouraging the declaration of the nutritive value of all foods. Thus consumers would be able to use ordinary products as components of the diet, using label declarations to choose the products most appropriate for their purposes. However, consumers are perhaps not well enough informed yet of this latter way as practicable.

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DIABETIKUS ÉS KALÓRIÁBAN SZEGÉNY ÉLELMISZERIPARI TERMÉKEK A FINNORSZÁGI PIACON

T. Kuusi és H. Tuorila

A Finnországban kapható diabétikus és kalóriában szegény élelmiszeripari termékekből vett 61 minta vizsgálata kémiai elemzésből (a nedvesség-, hamu-, fehérje-, zsír- és cukortartalom meghatározásából) és a kalóriatartalom kiszámításából állt, ezenkívül érzékszervi vizsgálatot végeztek egy 8–11 tagú testülettel. A kémiai elemzés értékei megegyeztek a címkéken közölt adatokkal, csak a zsirtartalomban mutatkozott némi eltérés. A cukorbetegek részére készült tejfagylalt kalóriatartalma a közönséges fagylalt kalóriatartalmának 2/3-a volt, tehát kalóriában szegénynek minősül. A szorbittal készült gyümölcspudding-porok viszont nagy kalóriatartalmúak voltak, ezért nem minősíthetők kalóriában

szegény termékeknek. Végül rövid áttekintést adnak a diétás készítményekre vonatkozó finn jogszabályokról. A mesterséges édesítőszernek mennyiségét a címkén meg kell adni. Túlnyomó részben szorbitot használnak a termékekben. Vizsgálataik szerint a termékválaszték kielégítő, a termékek minősége jó.

ДИАБЕТИЧЕСКИЕ И МАЛОКАЛОРИЙНЫЕ ПРОДУКТЫ ПИТАНИЯ НА РЫНКАХ ФИНЛЯНДИИ

Т. Кууси и Х. Туорила.

Из испытанных 61 образцов диабетических и в калориях бедных продуктов пищевой промышленности выпускаемых в Финляндии кроме химического анализа (определение влажности, золы, белка, жира, сахара) и расчетов содержания калорий проводили также и органолептическую оценку комиссией в составе 8 – 11 человек. Значения химического анализа были аналогичны данным указанных на этикетке, разницу наблюдали только в содержании жира. Содержание калорий в молочном мороженом изготавливаемого для диабетиков составляло 2/3, содержания калорий обычного мороженого, значит считается малокалорийным. Сорбитом изготавливаемые сухие фруктовые пудинги содержали много калорий и по этому они не считаются продуктом бедным в калориях. Дают краткую информацию о финляндских правовых нормах касающихся диетических продуктов. Количество искусственных подслащающих веществ указываются на этикетке. В продуктах большей частью используется сорбит. На основании проведенных испытаний установили, что ассортимент продуктов считается удовлетворительным, а качество хорошим.

DIABETISCHE UND KALORIENARME LEBENSMITTELPRODUKTE AUF DEM MARKT IN FINNLAND

T. Kuusi and H. Tuorila

Die Untersuchung von 61 aus den in Finnland zur Verfügung stehenden diabetischen und kalorienarmen Lebensmittelprodukten genommenen Mustern bestand aus einer chemischen Analyse (Bestimmung des Gehaltes an Wasser, Protein, Fett und Zucker) und aus der Berechnung des Kaloriengehaltes. Ausserdem wurde eine sensorische Bewertung durch ein Sachverständigengremium von 8 – 11 Personen durchgeführt. Die Angaben der chemischen Analyse stimmten mit den auf den Etiketten angeführten Werten gut überein, obwohl sich eine geringe Abweichung in dem Fettgehalt meldete. Der Kaloriengehalt des Milcheises betrug 2/3 des Kaloriengehaltes des gewöhnlichen Eises, daher ist es als kalorienarmes Produkt anzusehen. Die mit Sorbit hergestellten Frucht-puddingpulver wiesen dagegen einen hohen Kaloriengehalt auf, und sind so keine kalorienarme Produkte. Schliesslich wird eine kurze Übersicht über die finnischen Rechtsnormen bezüglich diätetische Produkte gegeben. Die Menge der synthetischen Süßmittel muss man auf der Etikette angeben. Für diesen Zweck verwendet man meistens Sorbit. Nach den Untersuchungen ist das Produktsortiment befriedigend und die Qualität der Produkte gut.

On a effectué l'analyse chimique de 61 produits sélectionnés parmi les denrées diabétiques et de faibles calories en vente en Finlande. L'analyse chimique comprenait la détermination des teneurs respectives en humidité, cendres, protéines, graisses et sucre et la calcul de la teneur en calories. A part de cela on a effectué l'analyse sensorique à l'aide de 8 à 11 arbitres. Les valeurs obtenues par l'analyse chimique étaient identiques avec celles qui figuraient sur les étiquettes. On n'a observé de déviations mineures que chez la teneur en graisses. La teneur en calories de la glace au lait préparée pour les diabétiques ne montait qu'à 2/3 de la valeur normale, ce produit était donc faible de calories. Les poudres des poudings à fruits préparées à la sorbite se montraient, par contre, d'une teneur élevée en calories et ne pouvaient être, qualifiés, par conséquent, comme produits de faibles calories. Enfin on passe en revue brièvement les règles juridiques adoptées en Finlande par rapport aux denrées diététiques. Il est de rigueur d'indiquer la quantité des édulcorants artificiels sur l'étiquette. Dans la plupart des produits on utilise de la sorbite. Selon les examens des auteurs le choix des produits est satisfaisant et leur qualité est bonne.