

A cross-sectional population survey on the consumption pattern of berries and berry products in Finland

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SELOSTE: VÄESTÖTASON TUTKIMUS MARJOJEN JA MARJATUOTTEIDEN KÄYTÖSTÄ SUOMESSA

Kuusipalo, J., Niemensivu, H., Berg, M-A. & Mikkola, M. 1989. A cross-sectional population survey on the consumption pattern of berries and berry products in Finland. *Seloste: Väestötason tutkimus marjojen ja marjatuotteiden käytöstä Suomessa*. *Silva Fennica* 23 1: 59 - 70.

The study is based on a questionnaire sent to 5000 randomly sampled persons representing the adult population of Finland. The results give a picture of the amounts of berries preserved for home use and the consumption patterns of berries and berry products in the population and its various subgroups. Non-commercial berry consumption accounts for a considerable part of the total use of fruits and berries. However, use of berries and berry products decreases with the degree of urbanization and from older age classes to the young. The results support the view that imported fruits and commercial juices are substitute products to domestic berries. It would appear that the consumer's choice between fruits and berries is primarily regulated by the availability of berries.

Tutkimus perustuu kirjalliseen kyselyyn, jonka kohderyhmänä oli 5000 henkilön satunnaisotos suomalaisesta aikuisväestöstä. Tulokset antavat varsin luotettavan kuvan säilötyistä marjamääristä ja marjojen käytöstä väestössä ja sen eri osaryhmissä. Kotitarvepoiminnan ja -säilönnän taloudellinen merkitys näyttää tulosten perusteella olevan huomattavan suuri. Esimerkiksi kotitekoisia mehuja käytetään huomattavasti enemmän kuin kaupallisia mehuvalmisteita. Toisaalta tuontihedelmien ja kaupallisten mehujen kulutus kasvaa kaupungistumisasteen myötä sekä vanhemmista nuoriin ikäluokkiin. Tulokset tukevat käsitystä, että kotimaiset marjat ja tuontihedelmät ovat toisiaan korvaavia tuotteita. Kuluttajan valintaa näiden tuotteiden välillä säädellee ensisijaisesti marjojen saatavuus.

Keywords: berries, berry products, consumption behaviour, forest berries, garden berries, multiple use forestry.
ODC 892. 71

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Accepted February 28, 1989

1. Introduction

In recent years, much research has been devoted to the yields of forest berries (Salo 1983, Raatikainen et al. 1984) and to the commercial value of these forest by-products (Kujala et al. 1986, Saastamoinen 1983). From the economical point of view, an important point of concern is that berries (90 % domestic) and fruits (95 % imported) are substitute products (Kuusipalo et al. 1986). According to the National consumption statistics (1985), the mean annual use of berries and fruits together is 72 kg *per capita*, but the bulk of that consumption (82 %) is met by imported fruits. It has been estimated (Maatalouden... 1985) that 3.5 kg of the total of 13 kg berries consumed annually *per capita* is met by forest or other wild berries, and 3 kg comes from home gardens. About 6 kg are produced in commercial gardens.

In the light of these figures, the home-garden berries and the berries picked from the wild can be considered equally important parts of the multiple use of the environment, the former that of the forests, the latter that of the nearest environs. Unfortunately, there are only a few incomplete data available on the non-commercial part of the consumption of the forest and home-garden berries in our country.

People today live in the cross currents of commercial supply, economic realities, nu-

tritional information, traditional habits and individual appetites and needs. The way in which the dietary choice is made, consciously or unconsciously, is reflected in daily food habits. These dietary practices are an important topic in the annual survey on the Finnish adult population, performed since 1978 by the National Public Health Institute (Piha et al. 1986). As a part of this annual survey, the East Finland Berry and Vegetable Project (Kuusipalo 1986, Kuusipalo et al. 1986) carried out a special survey in spring 1986 in order to learn about the consumption patterns of berries and other vegetable food among the Finnish population and its various subgroups.

The aim of the present article is to present the results of the part of the survey dealing with the consumption of berries and berry products. Since the survey will be repeated annually, later on the changes in the consumption and the patterns of consumption can be analysed and reported as a part of project evaluation.

We wish to thank Prof. Mikko Raatikainen and one anonymous referee for reading and commenting on the manuscript, and Prof. Pekka Puska for invaluable contribution to the study.

2. Material and methods

The material consisted of persons aged 15 to 64 years. A random sample of 5000 persons was drawn out from the Finnish National Population Register. Data collection was carried out by postal questionnaires, which were mailed in April 1986. Precoded questions were used to obtain information on various aspects of interest. Additional questions on socioeconomic background and subjective opinions were included. The sample as a whole was a

representative and reliable cross-section of the Finnish adult population (Piha et al. 1986).

For the purpose of this special study, the following precoded questions were included in the questionnaire.

- (1) On how many days, during the last week, did you eat (a) berries (b) fruits as such, in salads or desserts.

- (2) On how many days, during the last week, did you drink (a) home-made juice made of berries, (b) commercial juice made of domestic berries, (c) commercial juice made of fruits.
- (3) How many liters, during the last crop season, did you preserve (a) self-picked wild or home-garden berries, (b) berries bought from market places, food stores or commercial gardens.

As regards the preserved amounts, each respondent is considered to represent one household.

Unfortunately, the limited space of the questionnaire did not allow us to make separate questions for forest and home-garden berries or to distinguish between different species used or conserved. The questions were multipurposal and designed to serve other studies as well.

For the testing of different hypotheses, several subgroups were built in this study according to the sex, the age, the degree of education (in classification of 0-8, 9-12 and more than 12 schoolyears), the professional status, the degree of urbanization (in classification of the capital area, the area of other towns and the rural area), and the region (administrative districts, Fig. 1) (see Piha et al. 1986). Simple cross-classifications were performed in the preliminary analyses. After elaborations of the crosstabulations, the significances of expected differences between the subgroups were analysed with generalized linear models and related test statistics (Häkkinen and Linnilä 1987).



Fig. 1. Districts used in the regional comparisons. 1: Uusimaa 2: West Finland 3: Middle Finland 4: Southeast Finland 5: East Finland 6: North Finland.

Kuva 1. Tutkimuksessa käytetty aluejako. 1: Uusimaa 2: Länsi-Suomi 3: Keski-Suomi 4: Kaakkois-Suomi 5: Itä-Suomi 6: Pohjois-Suomi.

3. Results

Domestic berries are seldom available in the food stores but are mostly picked by the consumers themselves from forests and home gardens and preserved at home, or bought from market places and specialized farms where considerable amounts of both wild and garden berries are sold during the crop season. About 80 % of all respondents preserved wild and home-garden berries. Half of all respondents preserved more

than 14 liters and one-third more than 24 liters of these berries (Table 1). In addition, about 60 % of the respondents preserved bought berries, but the amounts were smaller: only half of all respondents preserved more than 4 liters of bought berries (Table 2).

These preserved amounts grew from young age groups to the older ones (Tables 1-2). The median of the preserved amounts

Table 1. The amount of self-picked wild or home-garden berries preserved during the last crop by sex and age (%).

Taulukko 1. Itse poimittujen luonnonmarjojen tai itse kasvatettujen marjojen säilölmäärä viime satokaudella sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
not at all	43.8	28.4	19.5	14.9	18.6	25.9	34.0	14.3	8.9	8.8	12.3	15.6	20.4	
1- liter	12.5	12.8	8.0	9.6	9.1	10.5	12.5	13.0	7.0	5.9	6.0	9.0	9.7	
5-14 liter	17.5	24.9	26.1	22.0	20.8	22.5	21.5	24.3	17.3	13.4	19.0	19.3	20.8	
15-24 liter	11.0	13.2	12.6	14.9	16.7	13.4	14.9	15.3	18.6	12.9	17.1	15.9	14.7	
24 liter or more	15.3	20.7	33.9	38.7	34.8	27.7	17.2	33.2	48.3	58.9	45.5	40.3	34.5	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	400	454	437	323	264	1878	424	470	474	387	415	2170	4048	
Missing obs.	8	1	2	3	10	24	1	2	3	4	7	17	41	

Table 2. The amount of bought berries preserved during the last crop by sex and age (%).

Taulukko 2. Ostettujen marjojen säilölmäärä viime satokaudella sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
not at all	62.0	48.0	38.2	39.5	40.5	46.2	53.0	34.5	26.7	31.1	34.2	35.8	40.7	
1- liter	12.6	12.7	9.3	8.4	7.8	10.4	14.2	12.2	8.6	7.2	9.5	10.4	10.4	
5-14 liter	15.6	25.8	24.8	28.9	24.9	23.8	22.7	27.5	30.8	28.2	29.4	27.8	25.9	
15-24 liter	5.3	7.3	14.1	12.2	15.2	10.4	6.1	13.4	17.2	14.1	14.7	13.2	11.9	
24 liter or more	4.5	6.2	13.7	10.9	11.7	9.1	4.0	12.4	16.6	19.4	12.2	12.8	11.1	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	387	450	432	311	25764	1847	423	469	464	376	401	2133	3980	
Missing obs.	11	5	7	15	170	55	2	3	13	15	21	54	109	

of wild and home-garden berries in the age group 15-24 years is 1-4 liters; the overall median (15 liters) was achieved in the age group 35-44 years. The largest amounts were preserved in the age group 45-54 years. The greatest amounts of bought berries were preserved among the respondents belonging to the age group 35-44 years, in

which almost 60 % of all respondents reported preserving at least 5 liters.

In a crosstabulation between the degree of urbanization and the amount of preserved wild and home-garden berries it was found that the preserved amounts very clearly grew from the urban areas to the rural areas (Table 3). Disregarding the age,

when the degree of urbanization was kept constant, none of the remaining socio-economical factors appeared as statistically significant independent predictor. The test statistics (likelihood ratio chi square), measuring the fit of the cell counts predicted by the degree of urbanization to the observed cell counts, gave the probability $p = 0.26$. As far as the bought berries are concerned, the crosstabulation of the preserved amounts with the degree of urbanization shows only that the smallest amounts are preserved in the capital area (Table 4). The best model was achieved by involving two predictor variables: the degree of education and the degree of urbanization ($p = 0.78$). Within the capital area and the area of other towns, the respondents representing higher degree of education (9-11 and 12 or more schoolyears) preserved more bought berries than expected.

There are also considerable regional differences in the consumption pattern of both wild or home-garden berries and bought berries (Table 5). The district of Uusimaa includes the capital area and the result is therefore confused by the small

Table 3. The amount of self-picked wild or home-garden berries preserved during the last crop by the degree of urbanization (%).

Taulukko 3. Itse poimittujen luonnonmarjojen tai itse kasvatettujen marjojen säilölmäärä viime satokaudella kaupungistumisasteen mukaan ryhmiteltynä (%).

Liters	not at all	1-15	more than 15
The capital area	33.9	28.2	27.9
Other towns	19.9	31.5	48.6
Rural area	15.7	26.5	57.9

Table 4. The amount of bought berries preserved during the last crop by the degree of urbanization (%).

Taulukko 4. Ostettujen marjojen säilölmäärä viime satokaudella kaupungistumisasteen mukaan ryhmiteltynä (%).

Liters	not at all	1-15	more than 15
The capital area	42.1	41.9	16.0
Other towns	37.1	38.1	24.8
Rural area	44.1	32.1	23.8

Table 5. The amount of berries preserved during the last crop by district (%) (see Fig 1).

Taulukko 5. Itse poimittujen luonnonmarjojen tai itse kasvatettujen marjojen (Ylempi taulukko) sekä ostettujen marjojen (alempi taulukko) säilölmäärä alueittain ryhmiteltynä (%) (ks. kuva 1).

	Preserved, liters not at all	Preserved, liters			
		1-4	5-14	15-24	25 or more
Self-picked wild or home-garden berries (%)					
1. Uusimaa	29.4	12.3	24.7	11.3	22.3
2. West Finland	19.0	10.4	22.2	17.0	31.4
3. Middle Finland	18.6	9.4	21.7	15.3	35.0
4. Southeast Finland	20.8	6.2	14.6	16.1	42.3
5. East Finland	13.1	6.5	17.5	14.9	48.0
6. North Finland	15.0	9.5	17.7	15.0	42.8
Bought berries (%)					
1. Uusimaa	41.2	12.1	29.3	9.8	7.6
2. West Finland	41.2	11.0	25.2	12.8	9.8
3. Middle Finland	37.3	10.2	27.6	13.2	11.9
4. Southeast Finland	45.1	6.5	21.9	11.8	14.7
5. East Finland	36.5	8.0	22.1	14.4	19.0
6. North Finland	44.2	11.8	25.0	9.8	9.2

average amounts of berries preserved by the people in Helsinki and its surroundings. As regards self-picked wild or home-farden berries, the districts of North Finland, East Finland and Southeast Finland differ from other districts in that about 60 % reported preserving at least 15 liters. On the other hand, the people in East Finland also preserved significantly more bought berries than the people in other districts, obviously because the bulk of the commercial berry farming is located in East Finland.

Almost 75 % of the respondents reported using berries as such or in salads or desserts at least on 1-2 days in a week (Table 6). The frequency is surprisingly high since the study period (7 days in question) was early spring, i.e. 8-10 months after the last crop. There were no big differences between the male and the female; nor did there exist any remarkable differences between the age groups. On the other hand, the consumption of berries as such (and in salads or desserts) grew from the capital area to the rural area. Effects of other socioeconomical factors were insignificant.

On the contrary, the consumption of imported fruits as such (Table 7) clearly grew from the rural area to the capital area, and the degree of education affected the fruit consumption so that highly educated people consumed more fresh fruits. In addition, the female consumed fruits more frequently than the male. The typical fruit-

eater is thus an academical female person who lives in Helsinki or its suburbs.

Self-reported frequencies of the use of different commercial juices are presented in Tables 8-9. Only one-third of the respondents had consumed commercial juices made of imported fruits during the week preceding the questionnaire. A few per cent more reported that they had used commercial juices made of domestic berries. Because most of the commercial juiced are mixtures which include both domestic and imported raw materials, these results are questionable.

In contrast to the commercial juices, the self-reported consumption of home-made juices is surprisingly high (Table 10). Only one-third of all respondents reported that they had not used home-made juices at all, while almost one-fourth had used at least six glasses in one week. However, in the capital area only half of all respondents reported using home-made juices, and almost half reported drinking at least one glass commercial juice in a week. Notable differences were found between the age classes, too (Tables 9-10). Younger people reported drinking commercial juices more often than the older people, whereas the consumption of home-made juices was highest in the oldest age classes (45-64 years).

Only 12 % of the respondents did not drink juice of any kind during the week preceding the questionnaire. On the other

Table 6. Use of berries as such during the last week (7 days) by sex and age (%).

Taulukko 6. Marjojen käyttö sellaisenaan viimeksi kuluneen viikon aikana sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
Never	31.0	36.6	30.3	29.9	29.1	31.7	24.3	22.7	20.0	21.8	18.8	21.5	26.3	
on 1-2 days	50.2	49.1	52.8	49.5	46.4	49.9	52.1	50.8	49.4	41.7	43.3	47.7	48.7	
on 3-5 days	17.7	12.8	14.8	15.9	18.8	15.7	20.5	22.9	23.4	28.5	29.8	24.9	20.6	
on 6-7 days	1.0	1.5	2.1	4.7	5.7	2.7	3.1	3.6	7.2	8.0	8.1	5.9	4.4	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	406	454	439	321	261	1881	424	472	474	386	420	2176	4057	
Missing obs.	2	1	0	5	13	21	1	0	3	5	2	11	32	

Table 7. Use of fruits as such during the last week (7 days) by sex and age (%).

Taulukko 7. Hedelmien käyttö sellaisenaan viimeksi kuluneen viikon aikana sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
Never	8.1	6.2	7.6	7.5	9.7	7.6	2.1	2.5	2.7	3.6	5.3	3.2	5.3	
on 1-2 days	38.8	36.6	34.3	33.4	33.6	35.6	23.2	23.6	22.1	21.6	25.6	23.2	29.0	
on 3-5 days	33.6	37.5	34.1	32.2	30.6	34.0	39.7	34.0	34.0	29.3	30.0	33.6	33.8	
on 6-7 days	19.5	19.6	24.0	26.9	26.1	22.8	35.0	39.9	40.8	45.5	39.1	40.0	32.0	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	405	453	437	320	268	1883	423	471	475	389	414	2172	4055	
Missing obs.	3	2	2	6	6	19	2	1	2	2	8	15	34	

Table 8. Use of the commercial juices, made of imported fruits, during the last week (7 days) by sex and age (%).

Taulukko 8. Ulkomaisista hedelmistä valmistettujen kaupallisten mehvalmisteiden käyttö viimeksi kuluneen viikon aikana sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
not at all	47.7	58.6	71.9	66.9	76.3	63.2	49.9	66.7	73.2	76.0	82.2	69.4	66.5	
1 glass	9.9	7.3	4.0	4.7	4.2	6.2	8.5	7.7	5.5	5.5	2.5	6.0	6.1	
2 glass	10.9	8.5	6.8	9.1	5.7	8.3	11.8	8.2	6.2	6.8	4.3	7.5	7.9	
3 glass	6.9	4.0	3.7	4.7	1.1	4.3	5.2	4.3	2.5	3.9	2.8	3.7	4.0	
4 glass	4.4	2.7	3.3	2.5	1.9	3.1	4.5	3.6	3.0	.8	1.3	2.7	2.9	
5 glass	6.9	8.7	3.3	4.7	5.3	5.9	7.8	3.6	4.5	2.6	3.8	4.5	5.1	
6 glass or more	13.3	10.2	7.0	7.5	5.3	9.0	12.3	5.8	5.1	4.4	3.3	6.2	7.5	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	405	449	427	320	262	1863	423	466	471	399	399	2143	4006	
Missing obs.	3	6	12	6	12	39	2	6	6	7	23	44	83	

hand, only 15 % of the respondents had not used milk during the study period. In Finland, the consumption of milk is at a considerably high level (252 liters *per capita* in a year), whereas the annual consumption of juices has been estimated to be 44 liters *per capita* (National consumption statistics 1985). It is a commonly held view that an

increase in juice consumption should be reflected in a corresponding decrease in the daily consumption of milk. However, as illustrated in Fig. 2, those who consume much juice also consume much milk, and vice versa. On the other hand, those who do not use milk at all consume juices more frequently than people on the average.

Table 9. Use of the commercial juices, made of domestic berries, during the last week (7 days) by sex and age (%).
Taulukko 9. Kotimaisista marjoista valmistettujen kaupallisten mehuvalmisteiden käyttö viimeksi kuluneen viikon aikana sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
not at all	39.4	50.3	64.4	62.5	74.0	56.6	48.1	60.3	69.9	74.5	81.0	66.4	61.8	
1 glasses	10.6	9.6	5.4	4.7	3.4	7.1	10.6	9.0	4.2	2.9	2.8	6.0	6.5	
2 glasses	15.1	10.5	9.4	8.4	4.6	10.0	13.0	9.2	7.2	7.0	5.3	8.4	9.2	
3 glasses	7.9	5.1	4.2	3.8	3.8	5.1	5.9	3.6	2.8	3.4	3.3	3.8	4.4	
4 glasses	5.4	2.7	4.4	4.7	2.3	4.0	3.8	5.6	2.1	1.3	.8	2.8	3.3	
5 glasses	5.4	7.6	3.0	6.3	2.3	5.1	8.0	4.9	5.5	6.0	2.3	5.4	5.2	
6 glasses or more	16.1	14.3	9.1	9.7	9.5	12.0	10.6	7.3	8.3	4.9	4.8	7.3	9.5	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	404	449	427	320	262	1862	424	466	471	384	399	2144	4006	
Missing obs.	4	6	12	6	12	40	1	6	6	7	23	43	83	

Table 10. Use of the home-made juices, made of domestic berries or fruits, during the last week (7 days) by sex and age (%).

Taulukko 10. Kotimaisista marjoista tai hedelmistä valmistettujen kotitekoisten mehujen käyttö viimeksi kuluneen viikon aikana sukupuolen ja iän mukaan (%).

	Men					Total	Women					Total		
	10 years age group						Total	10 years age group					Total	
	15-24	25-34	35-44	45-54	55-64			15-24	25-34	35-44	45-54			55-64
not at all	35.1	40.3	35.4	34.7	30.5	35.7	34.9	33.3	32.7	26.3	25.6	30.8	33.1	
1 glass	9.4	8.7	6.3	5.6	3.8	7.1	12.3	9.7	6.6	7.8	5.8	8.4	7.8	
2 glasses	13.6	11.6	12.4	8.1	11.8	11.6	14.9	12.9	11.3	10.9	14.3	12.8	12.3	
3 glasses	6.9	6.2	5.2	6.6	7.3	6.3	8.5	7.7	6.2	7.8	7.5	7.5	7.0	
4 glasses	5.4	4.2	6.8	5.9	6.9	5.7	4.5	7.1	7.0	6.0	7.5	6.4	6.1	
5 glasses	11.6	8.0	11.5	8.4	5.0	9.2	9.0	7.5	10.8	8.9	10.3	9.3	9.3	
6 glasses or more	18.0	20.9	22.5	30.6	34.7	24.3	16.0	21.9	25.5	32.3	29.1	24.7	24.5	
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total (N)	405	449	427	320	262	1863	424	466	471	384	399	2144	4007	
Missing obs.	3	6	120	6	12	39	1	6	6	7	23	43	82	

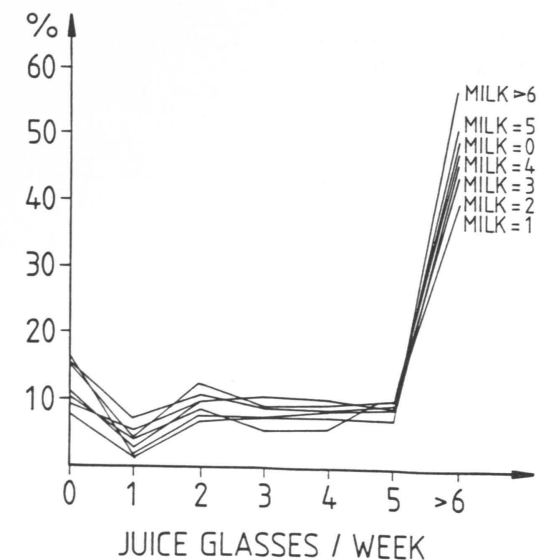


Fig. 2. The relationship between the use of juices and the use of milk (glasses in a week %).
Kuva 2. Mehujen ja maidon käytön suhde (lasillisia viikossa %).

4. Discussion

Although the consumption of imported fruits and refined fruit goods in Finland has increased continuously during the last fifteen years (KOM 1987), the tradition of picking forest and home-garden berries is still very strong: almost half of the respondents reported preserving at least 15 liters (about 9 kg) of these berries. Salo (1984) reported that an average household in the small towns of Joensuu (East Finland) and Seinäjoki (West Finland) usually picks 24-30 kg wild berries for home use, but in bad years the amount is threefold smaller. In normal years, the average amount of wild berries picked by one person is thus 6-8 kg. The inhabitants of Joensuu and Seinäjoki represent rather well the average consumers studied in this survey: they live outside the capital area but are not rural people (cf. Tables 5-6).

According to Kujala et al. (1986), the berry crop in the year 1985 was quite near

to the long-term average, as far as all berries together are concerned. For lingonberry (*Vaccinium vitis-idea* L.) the crop was poorer than average, but for home-garden strawberries (*Fragaria x ananassa* Duch.) the yield was rather good. For all wild berries together, the crop was approximately 40 % larger than in quite a bad year 1982 (cf. Salo 1984). According to these figures, one can roughly estimate that wild berries account for not more than 50 % of the total amount of berries preserved in autumn 1985. Taking into account the bought berries, the total amount of berries preserved by an average adult person in the year 1985 was at least 12 kg. The amount of berries bought by food industry and organized trading agents and companies was about 12,000 tons (2.4 kg per capita) (Kujala et al. 1986). In addition, huge amounts of both self-picked and bought berries (especially strawberries, an important seasonal deli-

cacy) are used fresh during the crop season.

It seems evident that the non-commercial part of the consumption of berries is much more important than has been estimated officially (Maatalouden . . . 1985). In particular, home-made juices obviously account for the bulk of the total juice consumption in Finland. However, there are considerable regional differences in the consumption behaviour. In the capital area, only 28 % reported preserving more than 14 liters self-picked berries and 16 % more than 14 liters bought berries, whereas in the population of East Finland the proportions were 63 % and 34 %, respectively. In the whole adult population, about 60 % reported drinking at least one glass of home-made juice in a week, but in the capital area the proportion was less than 50 %. On the other hand, 45 % of the city-dwellers in the capital area consumed commercial juices weekly, while in East Finland the corresponding proportion was only 28 %. As regards the exploitation of domestic raw materials, the pattern of juice consumption are of importance: on the average, commercial juices include only 6 % domestic berries (Mikkonen 1988).

The results provide further support to the view that domestic berries and imported fruits are truly substitute products, not only nutritionally but also economically (Kuusipalo et al. 1986). The availability of imported fruits does not differ markedly between rural and urban areas: national market chains are very efficient in distributing fruits and refined fruit products all over the country. However, there seems to be nothing that would prevent the inhabitants

of urban areas from eating more berries but the fact that berries are available for a reasonable price only seasonally. Fruits, on the other hand, can be bought all year round for very cheap price. It would thus appear that the availability of domestic berries primarily regulates the consumer's choice between imported fruits and domestic berries.

The yields of forest berries form an important part of our national property. However, the results of the present study imply that the exploitation of the berry yield will decline in the future. The preserved amounts, as well as the consumption of home-made juices, grow from urban to rural areas and from younger to older age classes. Consequently, the expected drop in the consumption of berries will result with the decline and aging of the rural population. On the other hand, the consumption of imported fruits and commercial juices made of imported raw materials will increase even further, although fruit import already accounts for one-third of the total import of agricultural products (Foreign trade statistics 1984).

However, increase in the consumption of domestic berries (at the expense of imported fruits) would be highly desirable, both economically and nutritionally (Kuusipalo et al. 1986). In order to change the evident contraversary trend in the consumption pattern, effective measures are needed. One measure could be instructional activity (maps, guidance, etc.) for urbanized people interested in picking berries as a part of their outing in the nature.

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Seloste

Väestötason tutkimus marjojen ja marjatuotteiden käytöstä Suomessa

Marjat ja hedelmät ovat ravitsemuksellisesti toisiaan korvaavia tuotteita. Koska hedelmät ovat 95-prosenttisesti tuontitavaraa ja marjat noin 90-prosenttisesti kotimaassa tuotettuja, niiden kulutussuhteet ovat myös kansantaloudellinen kysymys (Kuusipalo 1986, Kuusipalo & al. 1986). Marjojen ja hedelmien kokonaiskulutus on keskimäärin 72 kg asukasta kohti vuodessa, josta hedelmien osuuden on laskettu olevan 82 %. Maatalouden taloudellisen tutkimuslaitoksen (1985) arvion mukaan kotimaisista marjoista noin puolet (6 kg asukasta kohti vuodessa) tuotetaan ammativiljelmillä. Luonnonmarjojen kulutus on 3,5 kg ja kotipuutarhoissa tuotettujen marjojen kulutus arviolta 3 kg asukasta kohti vuodessa.

Kotitarvekäyttöön poimittujen ja kotipuutarhoissa kasvatettujen marjojen kulutuksesta ja käytön jakautumisesta väestössä ei ole olemassa kattavia selvityksiä. Määrät eivät näy kansantalouden kirjanpidossa. Tuotannosta on vaikea saada tarkkoja arvioita, koska se ei kulje järjestyneen kaupan kautta. Kuitenkin näiden marjojen taloudellinen arvo on huomattava. Luonnonmarjojen poiminta on tärkeä osa metsien moninaiskäyttöä. Vastaavasti kotitarveviljelyä voidaan pitää lähiympäristön, pihapiirin, eräänä monikäyttömuotona: tenniskentän kokoisella alalla voidaan parhaimmillaan tuottaa 50 kg mansikkaa vuodessa.

Kansanterveyslaitos on vuodesta 1978 seurannut suomalaisten ravitsemus- ja terveystietäytymistä aikuisväestöön (15-64 v) kohdistuvilla kyselytutkimuksilla (Piha et al. 1986). Osana tätä laajempaa tutkimusta Itä-Suomen marja- ja vihannesprojekti (Kuusi-

palo 1986, Kuusipalo & al. 1986) toteutti keväällä 1986 erikoistutkimuksen, jonka tarkoituksena oli selvittää kotimaisten marjojen käyttöä ja sen jakautumista väestön eri osaryhmissä sekä verrata kaupallisen tuotannon ja toisaalta kotitarvepoiminnan ja -viljelyn osuutta kulutuksessa.

Erikoistutkimusta varten lomakkeeseen liitettiin seuraavat kysymykset:

- (1) Miten usein olette syöneet marjoja sellaisenaan (myös esim. jälkiruokien yhteydessä) viimeksi kuluneen viikon aikana?
- (2) Miten usein olette syöneet hedelmiä viimeksi kuluneen viikon aikana?
- (3) Kuinka monta litraa itse poimittuja luonnonmarjoja tai itse tuottamianne marjoja säilöitte viime satokaudella?
- (4) Kuinka monta litraa torilta, kaupasta tai suoraan viljelijöiltä ostamianne marjoja säilöitte viime satokaudella?

Kussakin lomakkeessa on myös vastaajan sosioekonomista asemaa koskevia kysymyksiä, joista tähän tutkimukseen valittiin seuraavat vastaajakohtaiset taustatiedot: ikä, sukupuoli, koulutusaste, ammattiasema, asuinalue sekä kaupungistumisaste (pääkaupunkiseutu, muut kaupungit, maaseutu). Käyttötottumuksia eri osaryhmissä verrattiin ristiintaulukoinneilla. Havaittujen erojen testauksessa sovellettiin logistista ja logilineaarista mallitusta (ks. Häkkinen ja Linnilä 1987).

Noin 80 % vastanneista ilmoitti säilövänsä luonnonmarjoja ja/tai itsakasvatettuja marjoja. Puolet vastanneista oli säilönyt näitä marjoja vähintään 15 litraa (n.

9 kg) ja kolmannes vähintään 25 litraa (n. 15 kg). Lähes kaksi kolmannelle vastanneista oli säilönyt torilta tai muualta ostamia marjoja, mutta vain puolet kaikista vastanneista enemmän kuin 4 litraa (n. 3 kg). Keskimäärin vastanneet siis säilöivät n. 9 kg itse poimittuja tai kasvatettuja marjoja sekä 3 kg ostettuja marjoja. Säilöimismäärät kasvoivat vastaajan iän myötä.

Analysoitaessa säilöimismäärien jakautumista väestössä havaittiin, että ainoastaan kaupungistumisasteella on tilastollisesti merkitsevää vaikutusta itse poimittujen ja kasvatettujen marjojen säilöimismääriin. Myös alueelliset erot olivat varsin suuria. Yli 15 l itse poimittuja luonnonmarjoja tai itse kasvatettuja marjoja säilöneiden osuus pääkaupunkiseudulla oli vain 28 %, kun se Itä-Suomessa oli 63 %. Yli 15 litraa ostettuja marjoja säilöneiden osuus oli pääkaupunkiseudulla 16 % ja Itä-Suomessa 34 %.

Kolme neljänestä vastaajista oli syönyt marjoja vastauslomakkeen täyttöö edeltäneen viikon aikana. Tämä oli yllättävän korkea prosenttiosuus, koska satokaudesta oli vastausajankohtana kulunut jo 8–10 kuukautta. Myös marjojen käyttöiheyttä selitti parhaiten kaupungistumisaste. Lähes 95 % vastanneista oli nauttinut hedelmiä viimeksi kuluneen viikon aikana. Päinvastoin kuin marjojen kohdalla, käyttömäärät kasvoivat siirryttäessä maaseudulta kaupunkiin ja edelleen pääkaupunkiseudulle. Eniten hedelmiä kuluttivat keskimääräistä paremmin koulutetut, pääkaupunkiseudulla asuvat nuorehkot naiset.

Vain noin kolmannes vastanneista oli juonut kaupallisia mehuvalmisteita viimeksi kuluneen viikon aikana. Kotitekoisia mehuja ilmoitti juoneensa kaksi kolmannelle väestöstä, melkein neljännes lähes päi-

vittäin. Pääkaupunkiseudulla kulutussuhde oli tasaisempi. Lähes puolet ilmoitti juoneensa kaupallisia mehuvalmisteita ja lähes puolet kotitekoista mehua. Koko väestössä kotitekoisten mehujen kulutus painottui vanhoihin ikäluokkiin. Sen sijaan nuoret joivat eniten kaupallisia mehuvalmisteita. Toisin kuin joskus on esitetty, mehut ja maitovalmisteet eivät näytä olevan toisiaan korvaavia tuotteita: ne, jotka käyttävät paljon mehuja, juovat myöskin runsaasti nestemäisiä maitotuotteita (kuva 2).

Vaikka tuontihedelmien kulutus on viimeksi kuluneen viidentoista vuoden aikana kasvanut voimakkaasti, marjojen käytön perinne on Suomessa yhä voimakas. Kotitarvepoiminnan ja -viljelyn osuus kulutuksessa näyttää tämän tutkimuksen perusteella olevan otaksuttua merkittävämpi, näin varsinkin mehujen osalta. Huolestuttava piirre tuloksissa on marjojen ja kotitekoisten mehujen käytön painottuminen vanhoihin ikäluokkiin ja maaseutuväestöön. Vastaavasti tuontihedelmien ja kaupallisten mehuvalmisteiden, joiden raaka-aineista keskimäärin vain 6 % on kotimaista alkuperää, käyttö painottuu nuoriin ikäluokkiin ja kaupunkiväestöön, erityisesti pääkaupunkiseudulle. Maaseutuväestön ikääntyessä ja vähentyessä on odotettavissa, että kotimaisten marjojen kokonaiskulutus laskee ja tuontihedelmien sekä tuontipohjaisten jalosteiden kulutus edelleen kasvaa. Jo nyt tuontihedelmien osuus maataloustarvikkeiden tuonnin arvosta on samaa suuruusluokkaa kuin kahvin tuonnin, noin kolmannes. Kotimaisuusasteen kohottamiseksi tarvitaan tehokkaita toimenpiteitä, kuten marjojen tarjonnan parantamista kaupunkiseuduilla ja kaupunkilaisväestön innostamista ja opastamista luonnonmarjojen poimintaan.