

ASSESSMENT OF MILK AND MILK PRODUCTS CONSUMPTION AMONG ADOLESCENTS AGED 13-15 ACCORDING TO THEIR PLACE OF RESIDENCE

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Abstract. The objective of the study was to evaluate the frequency of eating of dairy products and the daily intake of these products in the population of 449 persons aged 13-15, representing rural and urban areas. The frequency of eating and the average daily intake of milk and its products were insufficient. The girls and the participants from the rural area consumed dairy products more seldom and in lower amounts in comparison with the boys and the participants from the urban area, respectively.

Key words: milk, dairy products, daily intake, frequency of consumption, adolescents

INTRODUCTION

Milk and milk products are of vital importance, particularly in children and adolescents' nutrition. These products are good sources of standard value and easy available proteins, calcium and vitamins B, especially riboflavin [Norma żywienia... 2001, Fisher et al. 2001].

The consumption of dairy products among children and adolescents is insufficient, both in rural and urban environment. Nevertheless, milk products consumption is lower in rural than in urban population [Gronowska-Senger et al. 1998, Wądołowska et al. 2002]. According to the survey carried out in 1985, 1989 and 1990 by Chwojnowska et al. [1992] among adolescents aged 11 to 15 years living in Warsaw; there was observed too low level of realization of recommendations for milk and milk products, described respectively: 58% (594 g), 62% (655 g) and 54% (563 g). In general, since the 1990 s there has been observed the decreasing tendency of milk intakes among young people [Gronowska et al. 1998, Stopnicka et al. 1998, Hamułka et al. 2001, Bowman 2002, Kołłajtis-Dołowy et al. 2003].

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The objective of the carried out survey was to assess the frequency of consuming milk and its products and the amount of their consumption in the population included 449 participants aged 13 to 15 years from the rural and urban environment.

MATERIAL AND METHODS

The survey was carried out in June and September 2003. The examined population included 449 adolescents; 262 girls and 187 boys aged 13 to 15 years from Warsaw and Garwolin commune. More than two thirds of adolescents represented urban area, and one third of the population lived in rural area. There were no differences in the share of boys and girls in rural and urban populations. The mothers of students represented a little higher level of education than their fathers. A higher percentage of mothers than fathers represented academic education and simultaneously more fathers than mothers had vocational education or lower than vocational education. The level of education, both of mothers and fathers, was significantly different in urban and rural environment. In urban population the percentage of mothers with academic education was four times higher, and in relation to fathers – ten times higher in comparison with rural environment, respectively.

More than four fifths of mothers were employed. In urban environment the mothers' employment rate was higher than in rural area. Only 6.4% of fathers were unemployed, significantly more unemployed fathers represented rural environment – Table 1.

Table 1. Socio-demographic characteristics of the adolescence's population and their parents, %
Tabela 1. Charakterystyka społeczno-demograficzna badanej młodzieży i jej rodziców, %

Population's features Cechy populacji	Total Ogółem (N = 449)	Place of residence Miejsce zamieszkania	
		urban area miasto (N = 277)	rural area wieś (N = 172)
1	2	3	4
Total – Ogółem	100.0	61.7	38.3
Gender – Płeć dziecka			
girls – dziewczęta	58.4	61.5	62.0
boys – chłopcy	41.6	38.5	38.0
Mother's education* – Wykształcenie matki*			
vocational school and lower – zawodowe i niższe	30.0	14.5	54.7
secondary school – średnie	29.5	27.6	32.6
university – wyższe	40.5	57.8	12.8
Mother's employment status* – Aktywność zawodowa matki*			
employed – pracująca	81.2	86.8	73.7
not employed – niepracująca	18.8	13.2	26.3

Table 1 – cont.

	1	2	3	4
Father's education* – Wykształcenie ojca*				
vocational school and lower – zawodowe i niższe		38.2	19.7	67.3
secondary school – średnie		31.8	33.8	28.7
university – wyższe		30.0	46.5	4.1
Father's employment status* – Aktywność zawodowa ojca				
employed – pracujący		93.6	96.3	90.1
not employed – niepracujący		6.4	3.7	9.9
Number of persons in family* – Liczba osób w rodzinie*				
3 persons and less – 3 osoby i mniej		16.3	21.7	7.6
4 persons – 4 osoby		40.3	52.7	20.3
5 persons – 5 osób		26.7	20.6	36.6
6 persons and more – 6 osób i więcej		16.7	5.1	35.5
Number of children in family* – Liczba dzieci w rodzinie*				
1 child – 1 dziecko		46.6	55.6	32.6
2 children – 2 dzieci		35.0	36.6	32.6
3 children and more – 3 dzieci i więcej		18.4	7.8	34.9

*Statistically significant differences between the population's feature and the place of residence, level of significance $p \leq 0.05$ (test χ^2).

*Różnice istotne statystycznie między cechą populacji i miejscem zamieszkania, poziom istotności $p \leq 0,05$ (test χ^2).

Participants' dairy products consumption was measured using the 24-h recall method [Charzewska and Chwojnowska 1998]. The 'Album of products with a different size of portions' was used for assessing the amount of eaten food [Szponar et al. 2000]. Computer program "Dieta 2" was used to assess the daily intake of dairy products. The results are presented as mean values and standard deviations of the means for groups of milk products separately, and for dairy products counted as liquid milk. The frequency of eating dairy products was examined using a 6-point scale containing the following descriptions: few times a day (1), once a day (2), 3-4 times a week (3), once a week (4), seldom (5), and never (6).

The analysis included frequency distribution, cross-tabulation, Chi-square analysis, and non-parametric U Mann-Whitney's test. The statistical analysis was made with SPSS 12.0 Pl for Windows at a significance level of $p \leq 0.05$.

RESULTS AND DISCUSSION

More than half of the survey participants reported drinking milk once a day or more frequently. More boys than girls reported drinking milk with such frequency. The place

of residence did not differentiate statistically significantly the frequency of drinking milk, nevertheless there were observed statistically significant differences between frequency of milk consumption among boys and girls in both rural and urban areas – Table 2.

Table 2. The frequency of eating dairy products in the population according to the place of residence and the gender, %

Tabela 2. Częstość spożywania mleka i przetworów mlecznych w badanej populacji z uwzględnieniem miejsca zamieszkania i płci badanych, %

Frequency of eating Częstość spożywania	Total Ogółem (N = 449)	Place of residence – Miejsce zamieszkania					
		rural area – wieś			urban area – miasto		
		total ogółem	girls dziew- częta	boys chłopcy	total ogółem	girls dziew- częta	boys chłopcy
Milk (a, b)* – Mleko (a, b)*							
few times a day – kilka razy dziennie	23.0	24.4	19.8	31.0	22.2	23.6	20.2
once a day – raz dziennie	29.8	27.9	23.8	33.8	30.9	24.2	40.4
3-4 times a week – 3-4 razy w tygodniu	17.9	13.4	16.8	8.5	20.7	24.2	15.8
once a week – raz w tygodniu	12.1	14.0	13.9	14.1	10.9	13.0	7.9
seldom – rzadziej	12.1	15.1	20.8	7.0	10.2	7.5	14.0
never – nigdy	5.1	5.2	5.0	5.6	5.1	7.5	1.8
Milk products (b) – Przetwory mleczne (b)							
few times a day – kilka razy dziennie	28.3	21.5	19.8	23.9	32.6	41.0	20.8
once a day – raz dziennie	27.3	31.4	31.7	31.0	24.7	26.1	22.6
3-4 times a week – 3-4 razy w tygodniu	26.1	26.1	30.7	19.7	26.1	20.5	33.9
once a week – raz w tygodniu	10.3	12.8	10.8	15.5	8.7	6.2	12.2
seldom – rzadziej	7.1	7.0	5.0	9.9	7.2	5.6	9.6
never – nigdy	0.9	1.2	2.0	0.0	0.7	0.6	0.9

*Statistically significant differences according to the gender and rural area (a) and urban area (b); test χ^2 , $p \leq 0.05$.

*Różnice istotne statystycznie po uwzględnieniu płci w środowisku wiejskim (a) oraz w środowisku miejskim (b); test χ^2 , $p \leq 0,05$.

More than half of the population (55.6%) consumed milk products once a day or more frequently. In urban area there were observed statistically significant differences between boys and girls, namely 67.1% of the girls and 43.0% of the boys consumed milk products once a day or more frequently (Table 2).

More than 90% of survey participants reported consuming milk and its products the day before the day of the survey. More respondents from urban area than from rural area consumed milk and its products – Table 3.

Table 3. The average daily intake of dairy products (counted as liquid milk) and the percentage of persons eating these products in the population according to place of residence and gender
Tabela 3. Średnie spożycie mleka i przetworów mlecznych (w przeliczeniu na mleko płynne) oraz odsetek spożywających te produkty w badanej populacji z uwzględnieniem miejsca zamieszkania i płci badanych

Population's features Cechy populacji	Mean value/standard deviation – Wartość średnia/odchylenie standardowe		
	amount per person eating product ilość/1 osobę spożywającą produkt g	percentage of persons eating product procent osób spożywających produkt	amount per person ilość/1 osobę g
Total – Ogółem	797.8 ±596.8	92.0	743.3 ±610.9
Rural area – Wieś	744.4 ±627.6	89.9 ^c	669.3 ±635.9 ^d
girls – dziewczęta	640.3 ±540.6 ^{a, b}	89.7	574.7 ±532.5 ^{e, f}
boys – chłopcy	886.6 ±709.4 ^b	90.1	799.2 ±723.7 ^f
Urban area – Miasto	829.0 ±578.6	95.3 ^c	789.3 ±635.9 ^d
girls – dziewczęta	783.6 ±517.5 ^a	95.0	744.7 ±532.5 ^e
boys – chłopcy	893.3 ±652.7	95.6	853.7 ±664.1

^{a, b, d, e, f}Values with the same letters differ statistically significantly, $p \leq 0.05$ (test U Mann-Whitney).

^cValues with this letter differ statistically significantly, $p \leq 0.05$ (test χ^2).

^{a, b, d, e, f}Zawartości oznaczone tymi samymi literami różnią się istotnie statystycznie przy $p \leq 0,05$ (test U Manna-Whitneya).

^cWartości oznaczone tą literą różnią się istotnie statystycznie przy $p \leq 0,05$ (test χ^2).

The average daily intake of dairy products counted as liquid milk was too low among the participants reported consumption of these products. On average, the boys consumed more milk per day than the girls. The amount of consumed milk was higher among the boys from rural area in comparison with the boys from urban area. The opposite situation was observed among the girls, namely girls from urban families consumed more dairy products than girls from rural area. The girls from rural families were characterized by the lowest average daily intake of dairy products, and the lowest percentage of participants consuming these products.

There were observed statistically significant differences between the average consumption of milk and its products among urban and rural population. The higher consumption of dairy products characterized participants from urban area (Table 3). The similar correlations were achieved by Hamułka et al. [2001], but the average consumption was lower than in the presented survey. According to Wajszczyk et al. [2004], in years 1982-2000 in Warsaw adolescents' population was observed the increase of milk products in all meals, with exception of breakfast. Nevertheless, other surveys results showed too low consumption of dairy products among adolescents [Szponar and Turlejska 1995, Przysławski et al. 1998, Ołtarzewski et al. 2003].

On the base of the presented results concerning consumption of milk and milk products it can be stated that the consumption of dairy products was insufficient, especially in the case of milk and fermented milk beverages. There was observed low share of fermented milk beverages in daily rations of adolescents. Only 18.7% of respondents informed about drinking these products the day before the day of the survey (Table 4).

Table 4. The average milk and milk products consumption and percentage of persons eating these products in the population

Tabela 4. Średnie spożycie mleka i przetworów mlecznych oraz odsetek spożywających je osób w badanej populacji

		Average amount per person eating product Średnie spożycie/ 1 osobę spożywa- jącą produkt g	Percentage of persons eating product Procent osób spożywają- cych produkt	Average amount per person Średnie spożycie/ 1 osobę w całej populacji g
Milk and milk products (counted as milk) ^c	total – ogółem	810 ±687	92.0	745 ±694
Mleko i przetwory mleczne (w przeliczeniu na mleko płynne) ^c	urban – miasto	853 ±721	87.8	
	rural – wieś	734 ±618	94.6	
Milk and not fermented milk beverages (total)	total – ogółem	231 ±259	74.8	174 ±246
Mleko i napoje z mleka słodkiego (ogółem)	urban – miasto	216 ±217	76.5	
	rural – wieś	258 ±316	72.1	
Milk with lower amount of fat ^c Mleko z obniżoną zawartością tłuszczu ^c	total – ogółem	219 ±253	61.9	136 ±226
	urban – miasto	207 ±197	66.8	
	rural – wieś	244 ±338	54.1	
Milk with normal amount of fat ^a Mleko pełnotłuste ^a	total – ogółem	144 ±215	26.7	38.5 ±127.9
	urban – miasto	114 ±230	24.9	
	rural – wieś	185 ±188	29.7	
Yogurt and yoghurt beverages Jogurty i napoje jogurtowe	total – ogółem	208 ±127	18.7	38.9 ±97.9
	urban – miasto	212 ±140	21.7	
	rural – wieś	198 ±88.4	14.0	
Ripening cheeses ^{a, c} Sery podpuszczkowe ^{a, c}	total – ogółem	56.7 ±40.5	54.6	32.6 ±55.2
	urban – miasto	53.4 ±38.4	62.8	
	rural – wieś	64.6 ±44.3	41.3	
Plain fresh cheeses ^c Sery twarogowe krojone ^c	total – ogółem	82.2 ±70.6	20.9	17.2 ±46.4
	urban – miasto	75.0 ±61.6	23.8	
	rural – wieś	99.2 ±87.2	16.3	
Homogenous cheeses ^c Serki homogenizowane w pojemnikach ^c	total – ogółem	150.1 ±53.6	16.9	25.4 ±60.5
	urban – miasto	146.9 ±59.4	20.2	
	rural – wieś	159.3 ±31.9	11.6	

^aStatistically significant differences according to average amount per person eating product.^bStatistically significant differences according to average amount per person.^cStatistically significant differences according to percentage of persons eating product.^aRóżnice istotne statystycznie w przypadku średniego spożycia na 1 osobę spożywającą produkt.^bRóżnice istotne statystycznie w przypadku średniego spożycia na 1 osobę.^cRóżnice istotne statystycznie w przypadku odsetka osób spożywających produkt.

The consumption of ripening cheeses was the most correct according to recommendations. Nevertheless, a lot of daily rations (45.4%) did not contain ripening cheeses. The differences in the average amount of milk and milk products in daily rations and in the percentage of participants reported their consumption were indicated also in other studies carried out among young people [Hamułka et al. 2001, Kołłajtis-Dołowy et al. 2003].

CONCLUSIONS

According to the results of the undertaken survey, it can be stated that:

1. Too low frequency of eating milk and its products and to low intake of these products characterized the investigated population.

2. The place of residence differentiated statistically significant most of the assessed indicators. The participants from rural area represented more negative values of indicators, i.e. the lower frequency of eating milk and its products, the lower daily intake of these products, and the lower percentage of persons eating these products on the day before the day of the survey.

The incorrectness in the eating frequency and the intake of dairy products should be taken into consideration when nutritional education is planned. There is a necessity to implement knowledge on milk products and on the consequences of their consumption into nutritional education process and nutritional interventions in order to improve the existed situation. Schools should also help promote milk intake. In school cafeterias milk products should be displayed in areas that are easily seen and accessed by students.

REFERENCES

- Augustyniak U., Brzozowska A., 2002. Sposób żywienia młodzieży w Polsce na podstawie piśmiennictwa z ostatnich 10 lat (1999-2000) [Nutrient intake of the adolescents in Poland on the basis of literature from last ten years (1999-2000)]. *Rocz. PZH*, 53, 4, 399-406 [in Polish].
- Bowman S.A., 2002. Beverages choices among young females: changes and impact on nutrient intake. *J. Am. Diet. Assoc.* 102, 1234-1239.
- Charzewska J., Chwojnowska Z., 1998. Zalety i wady wybranych metod oceny spożycia żywności ze szczególnym uwzględnieniem metody wywiadu [Advantages and disadvantages of selected methods of nutritional intake assessment with regard to questionnaire method]. *Żyw. Człow. Metab.* 15, 1, 65-73 [in Polish].
- Chwojnowska E., Charzewska J., Rogalika-Niedźwiedz M., Chabrom E., 1992. Zmiany w sposobie żywienia uczniów z warszawskich szkół podstawowych w przełomowym okresie lat 1989-1990 z uwzględnieniem płci i wieku badanych [Changes of diets of children in Warsaw elementary schools in the transitional economic period of 1989-1990]. *Żyw. Człow. Metab.* 19, 3, 165-175 [in Polish].
- Czeczulewski J., Huk-Wieliczuk E., Michalska A., Raczyńska B., Raczyński G., 2001. Ocena sposobu żywienia dzieci ze środowiska wiejskiego i miejskiego z terenu południowego Podlasia [Assessment of nutrition intake of children from rural area of south part of Podlasie]. *Żyw. Człow. Metab.* 28, suppl. 537-543 [in Polish].
- Fisher J.O., Mitchell D.C., Smiciklas-Wright H., Birch L.L., 2001. Maternal milk consumption predicts the tradeoff between milk and soft drinks in young girls' diets. *J. Nutr.* 131, 2, 246-250.

- Gronowska-Senger A., Drywień M., Hamułka J., 1998. Analiza stanu żywienia dzieci w wieku przedszkolnym i szkolnym w oparciu o istniejące piśmiennictwo z lat 1980-1995 [Analysis of nutrition of children at preschool age based on reports in literature in 1980-1995]. *Rocz. PZH.* 49, 377-388 [in Polish].
- Hamułka J., Wawrzyniak A., Gronowska-Senger A., Kowalczyk J., 2001. Ocena spożycia mleka i przetworów jako źródła wapnia i ryboflawiny przez dzieci w wieku szkolnym [Intake evaluation of milk and milk products as a source of calcium and riboflavin by school children]. *Żyw. Człow. Metab.* 28, suppl. 403-409 [in Polish].
- Kołątjis-Dolowy A., Pietruszka B., Waszczeniuk-Uliczka M., Chmara-Pawlińska R., 2003. Wybrane zachowania żywieniowe młodzieży w wieku 14-16 lat z Warszawy [Some of the nutritional habits among children 14-16 years old in Warsaw]. *Żyw. Człow. Metab.* 30, 182-187 [in Polish].
- Kunachowicz H., Nadolna I., Przygoda B., Iwanow B., 1998. Tabele wartości odżywczej produktów spożywczych [Food composition tables]. *Inst. Żywn. Żyw.* Warszawa [in Polish].
- Normy żywienia człowieka. Fizjologiczne podstawy [Dietary standards. Physiological background, 2001. Ed. S. Ziemiański. PZWL Warszawa [in Polish].
- Ołtarzewski M., Szponar L., Rychlik E., 2003. Spożycie wapnia wśród dzieci i młodzieży w Polsce [Calcium consumption among children and teenagers in Poland]. *Żyw. Człow. Metab.* 30, 1/2, 278-283 [in Polish].
- Przysławski J., Gertig H., Bolesławska I., Duda G., Maruszewska M., 1998. Analiza zmian poziomu i struktury spożycia wybranych składników mineralnych występujących w racjach pokarmowych [Analysis of changes of the levels and structure of composition of certain mineral components present in food rations of various population groups]. *Żyw. Człow. Metab.* 25, 2, 122-132 [in Polish].
- Stopnicka B., Szamrej I.K., Jerulanek I., 1998. Ocena jakości żywienia dzieci ze szkół podstawowych – promujących zdrowie i innych szkół podstawowych z terenu województwa białostockiego w świetle badań ankietowych prowadzonych przez Wojewódzką Stację Sanitarno-Epidemiologiczną w Białymstoku w latach 1997 i 1998 [Assessment of individual nutrition intake of children at school age from primary schools in Białystok province]. *Żywn. Żyw. Zdrowie* 4, 392-400 [in Polish].
- Szponar L., Wolnicka K., Rychlik E., 2000. Album fotografii produktów i potraw [Album of products with different size of portions]. *Inst. Żywn. Żyw.* Warszawa [in Polish].
- Szponar L., Turlejska H., 1995. Mleko i jego przetwory w żywieniu różnych grup ludności [Milk and its products in nutrition of various population's groups]. *Żyw. Człow. Metab.* 22, 361-368 [in Polish].
- Wajszczyk B., Charzewska J., Chabros E., Chwojnowska Z., Rogalska-Niedźwiedz M., 2004. Zmiana zwyczajów żywieniowych młodzieży w wieku pokwitania z Warszawy na przestrzeni ostatnich 30. lat obserwacji [Change of nutritional habits of the Warsaw adolescents over the recent 30 years observation]. *Żyw. Człow. Metab.* 31, suppl. 2, 136-141 [in Polish].
- Wądołowska L., Babicz-Zielińska E., Schlegel-Zawadzka M., Przysławski J., Czarnocińska J., 2002. Preferences, consumption and choice factors for milk and its products among school children. *Pol. J. Food Nutr. Sci.* 11/52, 2, 81-86.

OCENA SPOŻYCIA MLEKA I PRZETWORÓW MLECZNYCH WŚRÓD MŁODZIEŻY W WIEKU 13-15 LAT Z UWZGLĘDNIENIEM MIEJSCA ZAMIESZKANIA

Streszczenie. Celem pracy była ocena częstotliwości spożywania mleka i jego przetworów oraz wielkości ich spożycia w populacji 449 osób w wieku 13-15 lat, reprezentującej

środowisko wielkomiejskie i wiejskie. Częstotliwość spożywania oraz średnie spożycie mleka i jego przetworów było niewystarczające w badanej populacji. Dziewczęta oraz osoby reprezentujące środowisko wiejskie spożywały mleko i przetwory mleczne z mniejszą częstotliwością oraz w mniejszych ilościach niż chłopcy i reprezentanci środowiska wielkomiejskiego.

Słowa kluczowe: mleko i przetwory, spożycie dzienne, częstotliwość spożywania, młodzież

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