

RESEARCH ARTICLE

IMPACT OF ECONOMIC CRISIS AND SOCIO-DEMOGRAPHIC FACTORS ON MILK AND MILK PRODUCT CONSUMPTION OF UNDERGRADUATES: A CASE STUDY OF EASTERN UNIVERSITY, SRI LANKA

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Received: 11 January 2024, Accepted: 28 May 2024, Published: 30 June 2024

ABSTRACT

Milk consumption is influenced by a wide range of factors, including gender, age, income, education, ethnicity, health condition, and presence of children in the household. The current study was designed to investigate the effects of the recent economic crisis and socio-demographic factors on the milk and milk product consumption patterns of undergraduates. The questionnaire survey was used as the primary data collection tool. The survey was conducted with a representative sample of undergraduates (n=238) using a self-structured online questionnaire. The collected data was analyzed using descriptive and inferential statistics. As per the results, the majority of undergraduates in the sample size consume raw milk (83%). Therefore, cattle milk was the most widely consumed type of raw milk (84%). Ice cream is the most popular milk product (99%) in sample size. Despite the economic crisis, the majority of undergraduates (53%) maintain steady milk consumption habits. However, the milk consumption of undergraduates during the financial crisis was significantly associated with factors including locality (p=0.017), family size (p=0.014), monthly family income (p=0.000), parental educational level (p=0.000), and employment status (p=0.014). Further, this study investigated the fact that the purchasing frequency of milk and milk products was not associated with socio-demographic backgrounds (P>0.05).

Keywords: consumption, economic crisis, milk, processed milk and Socio-demographic profile

INTRODUCTION

Milk is essential for reducing food poverty (Madhuwanthi *et al.* 2022). Besides that, milk is a nutrient-dense food rich in proteins and other necessary micronutrients (Akbay and Tiryaki 2008; Gorska-Warsewicz *et al.* 2019). Clinical and biochemical studies suggested that drinking fluid milk, especially low-fat milk, may also help lower the risk of developing hypertension, dental cavities, stroke, heart disease, and colon cancer (Akbay and Tiryaki 2008). In 2021, the per capita availability of milk and milk products in Sri Lanka was 48.69 liters. However, compared with 2018 it decreased by 9.34 liters (Department of Animal Production and Health, 2021). Moreover, according to Perera *et al.* (2018), 82% of Sri Lankans consume fresh milk.

Several factors hamper and facilitate dairy consumption (Rabiei *et al.* 2021). Numerous studies demonstrated that the consumption of dairy products is influenced by several factors such as income, education (Onurlubaş and Yılmaz, 2013), Location, gender (Kapaj, 2018), age, ethnicity, health concern (Boniface and Umberger, 2012), and presence of young children in the household (Kapaj, 2018).

Sri Lanka is currently experiencing a political and economic crisis. Rising prices and sporadic protests continue to be issued (George *et al.* 2022). Effectively, inflation reduces our ability to buy all kinds of products. Furthermore, Rabiei *et al.* (2021) reported that the choice of food is significantly impacted by both the rise in food

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prices and the decline in household income. Communities with comprehensively integrated physical structures, instructional programs, a certain style of administration, and a range of services are referred to as universities (Ariyawansa, 2008). The younger generation in Sri Lanka, who are between the ages of 18 and 24, typically begin their higher education currently by enrolling in universities. Although most undergraduates were knowledgeable about the benefits of consuming a balanced diet, the majority of them were not sticking to a nutritious lifestyle (Tok *et al.* 2018). The healthy lifestyle of undergraduates greatly enhances the future of the country since they make up a considerable portion of the population that propels the growth of a country. The institution is therefore the ideal place to satisfy the needs of the whole youth community in terms of nutritional education. However, the consumption pattern of milk and milk products among undergraduates has only been subjected to a few studies in Sri Lanka (Madhuwanthi *et al.* 2022). According to our knowledge, there were no research studies on the milk consumption pattern of undergraduates during the economic crisis in Sri Lanka. As a result, the current study aims to identify sociocultural factors that are associated with the milk and milk product consumption pattern of university students and to investigate the effects of the economic crisis on the milk and milk product consumption of university students.

METHODOLOGY

In order to choose the sample, a judgment sampling strategy was used. Based on the pre-interview, undergraduate hostellers at the Eastern University of Sri Lanka were chosen to fill online questionnaire. To represent undergraduates in Sri Lanka, the data collection was conducted in five faculties of Eastern University, Sri Lanka: Agriculture, Technology, Biological Science, Arts and Culture, and Commerce and Management. The research was conducted between 1st June and 30th September 2023. In this study, the questionnaire served as a data-gathering tool. The main technique for gathering primary data was distributing a Google Form-based, structured questionnaire to the sample. In this

study, 268 undergraduate hostellers were part of the sample and 89% of them responded. The questionnaire primarily focused on sociodemographic factors including “age, sex, locality, family income, family size, education and employment level of guardian, and living province”, milk consumption and purchasing patterns such as “preference and purchasing frequency of raw and processed milk, purchasing place, factors considered during the purchasing, and awareness regarding the milk consumption”, and also the effect of economic crisis on milk consumption. The secondary data was gathered using research articles and websites related to milk and milk product consumption patterns. Prior to analysis, the data were transformed into a spreadsheet and reviewed for errors. The data obtained by the questionnaire were analyzed for inferential statistics using the chi-square test by using IBM SPSS statistical package version 25.0. Data were significant at the level of 0.05. The chi-square test was utilized to investigate the relationship of sociodemographic profile and economic crisis with milk consumption and purchasing patterns. A descriptive statistical technique was used to describe the socio-demographic profile of undergraduates and the milk and milk product consumption and purchasing pattern using Microsoft Excel 13.0.

RESULTS AND DISCUSSION

Socio-demographic profile

The percentages of male and female contributions throughout the study were 17.23 and 82.77, respectively. It was indicated that the majority of undergraduates are female. It was in agreement with Madhuwanthi *et al.* (2022). Table 1 shows the socio-demographic structure of the studied population. As per the results, the highest percentage of undergraduates who represent this study was within the age range of 20-24 years (83.19%). The majority of respondents who participated in the study were living in rural areas. Furthermore, most respondents stated that the monthly income of the family is LKR 20,000-40,000. Moreover, 33.61% of respondent's family size was four.

Table 1: Sociodemographic profile of undergraduates

	Criteria	Percentage (%)
Age	24-25	83.19
	25-29	16.81
Locality	Urban	47.48
	Rural	52.52
Family's monthly income (Rs)	20000>	16.39
	20000-40000	28.57
	40000-60000	19.75
	60000-80000	14.29
	80000-100000	13.87
	100000<	7.14
Family size	2	4.20
	3	12.18
	4	33.61
	5	32.77
	6	13.45
	7	3.78
Guardian's education	Primary school	1.26
	Middle school	27.73
	High school	34.87
	Diploma	10.08
	Degree	26.05
Guardian's employment	Fulltime	52.94
	Part-time	8.82
	Unemployed	11.34
	Retired	16.39
	Homemaker	10.50
Province	Eastern	26.89
	Western	21.43
	Northern	3.36
	Southern	5.46
	Central	12.18
	Uva	9.24
	North-western	9.24
	North-central	7.56
	Sabaragamuwa	4.62

Consumption and purchasing pattern of milk and processed milk products

Milk consumption and purchasing attributes of the studied population of undergraduates are shown in Table 2. Only 3.36% of those respondents identified as vegetarians. However, the majority of them drink milk obtained from animals. The majority of respondents (83.19%) were consuming milk, and this result accordance with the finding of Madhuwanthi *et al.* (2022), who reported 92% of students were preferred to drink milk in any form, whereas 8% of them did not prefer milk. Most of the respondents were not satisfied with the price of milk. Because the

purchasing frequency of milk is associated ($n=238$, $X^2=10.891^a$, $p=0.028$) with the price of milk. Increasing the price of milk leads to a decrease in the purchasing frequency. It is caused by inflation driven due to the current economic crisis in Sri Lanka. However, the majority of the respondents were satisfied with the quality of purchased milk and processed milk products, and most of the undergraduates purchased milk and milk products from supermarkets, followed by retail shops and milk shops, respectively.

Table 2: Milk consumption and purchasing attributes of the studied population

	Criteria	Percentage (%)
Vegetarian	Yes	3.36
	No	91.60
	May be	5.04
Consume milk	Yes	83.19
	No	16.81
Raw milk purchasing	Daily	16.81
	Once a week	15.55
	2/3 times per week	13.87
	Once a month	37.39
	2/3 times per month	16.39
Processed milk purchasing	Daily	15.97
	Once a week	26.47
	2/3 times per week	23.11
	Once a month	19.75
	2/3 times per month	14.71
Price satisfaction	Yes	31.09
	No	68.91
Quality satisfaction	Yes	56.30
	No	43.70
Purchasing place	Supermarket	45.80
	Retail shop	23.95
	Milk shop	14.71
	Other ways	15.55

Many of the respondents preferred cattle milk, followed by buffalo milk. Ice cream was found to be the most consumed form of processed milk product, followed by yoghurt, cheese, processed drinks, curd, paneer, and other varieties (Figure 1). People are more likely to prioritize processed foods due to the major changes in the sociodemographic and socioeconomic status of the population, including their lifestyle, age, education, and financial status (David *et al.* 2009).

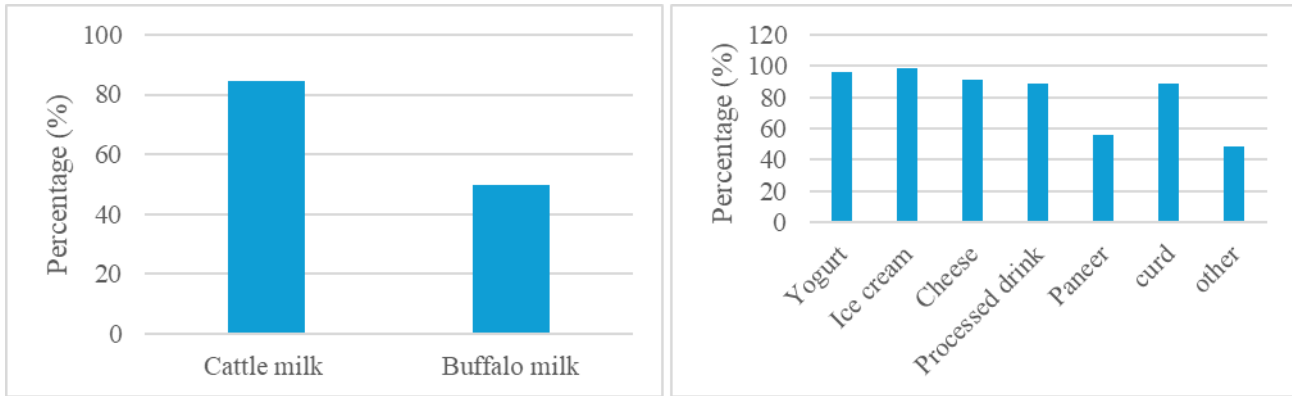


Figure 1: The preference for individual kinds of raw milk and processed milk products.

The factors considered by respondents during the purchasing of raw and processed milk are indicated in Figure 2. The majority of respondents considered their health during the purchasing of milk and milk products followed by economic concern, distaste, and age of household members. However, a few numbers of respondents said distrust of production and factory processing, which affects their purchasing of milk. Furthermore, taste, health, quality, price, package, and advertisement are the most important factors influencing the purchase of milk and milk-related products (Kurajdova and Taborecka-Petrovicova 2015).

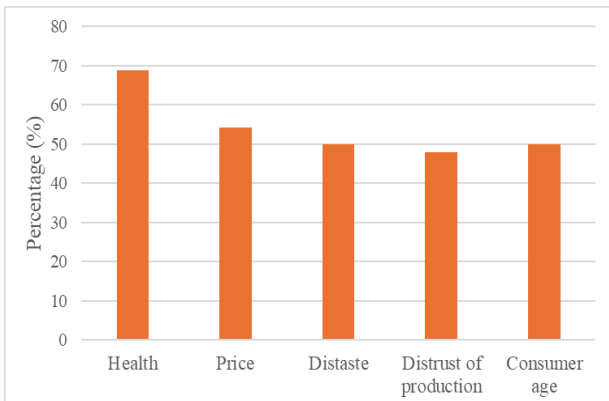


Figure 2: Factors considered during the purchasing of milk

Association between socio-demographic profile with milk consumption and purchasing pattern

Table 3 indicates the association between socio-demographic profile, and milk consumption and purchasing patterns. There was no significant association ($p > 0.05$)

between socio-demographic profile and raw milk consumption. According to Madhuwanthi *et al.* (2022), there was no significant association between any other demographic factors and the preference for milk, except gender. According to Madhuwanthi *et al.* (2022), only "gender" showed a significant correlation with milk consumption, suggesting that more women preferred to drink milk than men. However, Melesse and Beyene (2009) revealed that household income and household location were positively correlated with the consumption level of milk. There were no significant associations between the first choice of milk type and factors such as sex, family size, education level of the guardian, employment status of the guardian, and price of the milk. However, there were significant associations ($p < 0.05$) between the first choice of milk type and factors such as locality and monthly income of the family, where 94 (98.95%) out of 95 respondents who live in an urban area reported that their first preferred milk type is cattle milk. There was a significant association between milk purchasing place and socio-demographic characteristics such as sex, locality, monthly income of the family, education level of guardian, and price of milk. It indicates that the majority of females (48.73%) are purchasing milk from supermarkets. On the other hand, the majority of the males (41.46%) are purchasing milk from retail shops. Most respondents (59.65%) were located in urban areas and 70.59% of respondents with a monthly household income of more than Rs. 100,000, while

45.16% of respondents with a degree holding guardian bought milk and milk products from a supermarket. In many parts of the world, the expansion of large retailers, including hypermarkets and supermarkets, creates a new point of interaction between producers and customers (Bai *et al.* 2008; Reardon *et al.* 2003). However, 77.06% of respondents who purchase milk from the supermarket are not satisfied with the price of the milk and milk products. The price of powdered milk has reached its greatest level due to the serious shortage of the product and the economic crisis occurring in Sri Lanka (Silva and Senanayake 2023). On the other hand, the majority of respondents (52.17%) who purchased milk from the milk shop were satisfied with the price of the milk and milk products. There was no significant association between socio-demographic profile and raw milk purchasing and processed milk purchasing frequency. However, there was a significant association between the price of milk and raw milk purchasing frequency. Around 22% of respondents were satisfied with the price of raw milk purchased daily. Individuals in high-income households are expected to consume more milk than those in medium- and low-income groups (Melesse and Beyene 2009). Raw milk was purchased once a month by the majority of respondents (44.24%) who expressed dissatisfaction with

the price of milk. Consumer purchasing behavior is primarily determined by social, cultural, psychological, and individual variables. These factors affect consumers' preferences for new products and their brands (Madhuwanthi *et al.* 2022; Rani 2014)

State of awareness and knowledge regarding milk consumption

Figure 3 shows the level of knowledge and awareness of milk intake among university students. The majority of undergraduates surveyed believe that drinking too much milk may cause illness. A certain proportion of people are aware that eating habits might cause health issues like obesity, cancer, kidney failure, and other conditions like heart disease.

The majority of students concurred that drinking milk is necessary to meet one's daily nutrient requirements. However, a small amount (6%) of undergraduates drink milk without even being aware of it. Most students have a solid understanding of the processing methods used for processing milk, including pasteurization, standardization, ultra-high temperature treatment, spray drying, and homogenization, respectively. On the other hand, a considerable number of undergraduates lack a thorough understanding of milk processing methods.

Table 3: Association between socio-demographic profile, and milk consumption and purchasing patterns

Socio-demographic profile		Consuming raw milk	First preferred milk type (cattle, buffalo, sheep, goat)	Purchasing place	Raw milk purchasing frequency	processed milk purchasing frequency
Sex	X ²	0.716 ^a	0.912 ^a	10.831 ^a	5.540 ^a	3.624 ^a
	p	0.397	0.822	0.013	0.236	0.459
Locality	X ²	0.107 ^a	10.128 ^a	17.728 ^a	1.644 ^a	4.429 ^a
	p	0.744	0.018	0.001	0.801	0.351
Family size	X ²	4.583 ^a	13.759 ^a	20.078 ^a	15.109 ^a	12.147 ^a
	p	0.469	0.544	0.169	0.770	0.911
The monthly income of family	X ²	10.993 ^a	26.165 ^a	42.615 ^a	20.050 ^a	29.017 ^a
	p	0.052	0.036	0.000	0.455	0.087
The education level of guardian	X ²	4.634 ^a	7.346 ^a	24.127 ^a	15.531 ^a	20.753 ^a
	p	0.327	0.834	0.020	0.486	0.188
Employment status of guardian	X ²	9.286 ^a	10.750 ^a	17.606 ^a	16.907 ^a	14.904 ^a
	p	0.054	0.550	0.128	0.392	0.532
Satisfaction on price	X ²	0.042 ^a	3.972 ^a	10.743 ^a	10.891 ^a	5.848 ^a
	p	0.837	0.264	0.013	0.028	0.211

X²-Pearson Chi-Square value; p<0.05-significant association between two variables

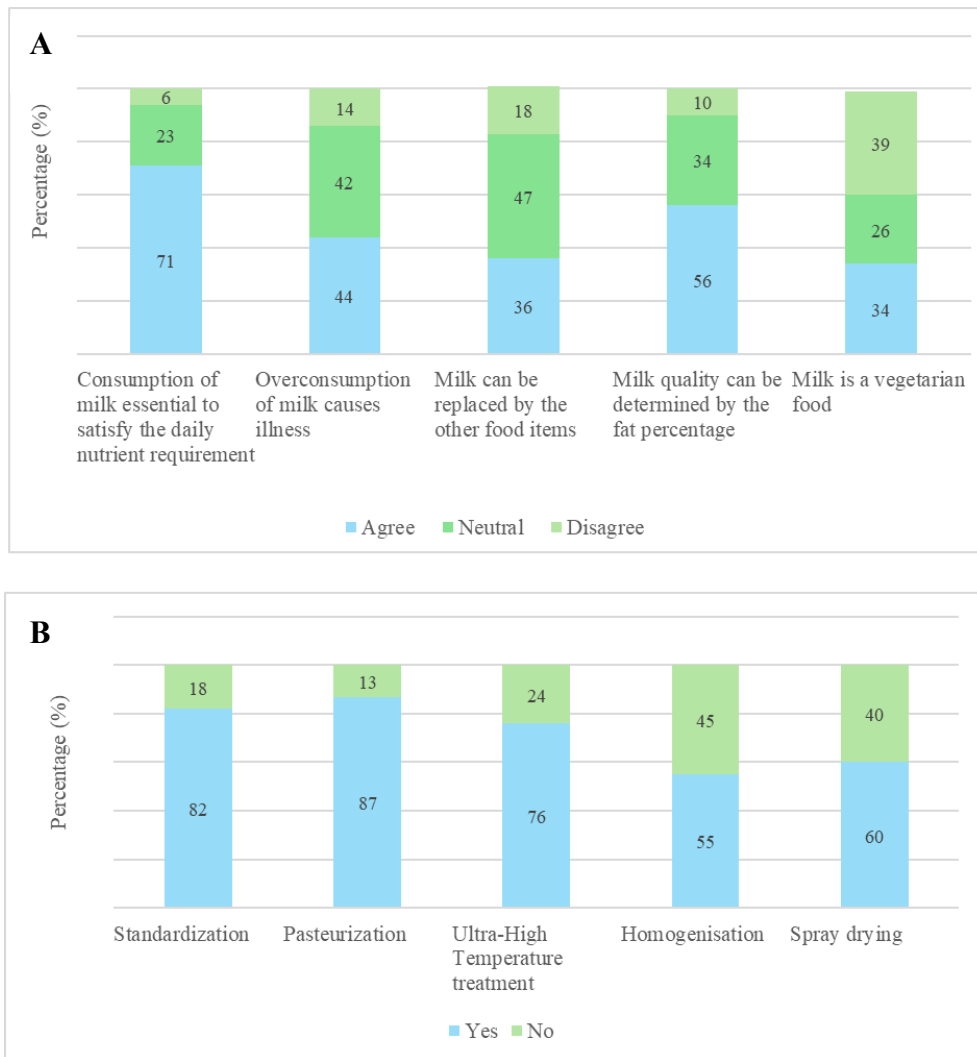


Figure 3: (A) The awareness of milk consumption and (B) milk processing techniques among university students

Impact of economic crisis on recent milk consumption and purchasing

Figure 4 depicts the variations in milk consumption over Sri Lanka's economic crisis. Most of the respondents said their milk consumption remained unchanged. However, the result of Suheera and Wazeema (2023) revealed that following the country's economic crisis, female-headed households' food intake, both the quantity and quality of food they ate, drastically decreased.

The association between the sociodemographic profile and the economic crisis and its effects on milk consumption are shown in Table 4. During Sri Lanka's economic crisis, there was no discernible link between milk consumption and sex.

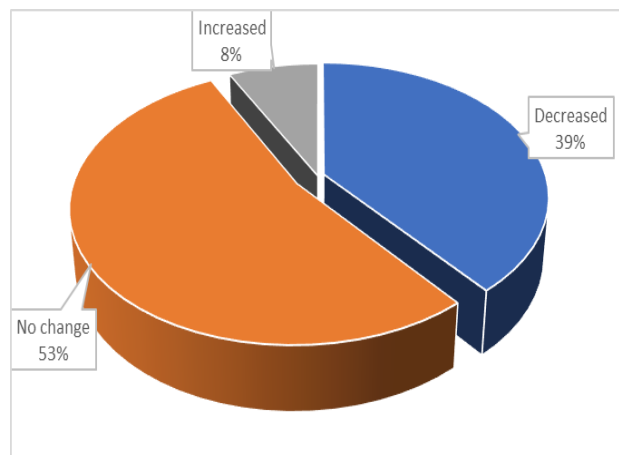


Figure 4: Changes in milk consumption during the economic crisis in Sri Lanka

Table 4: Impact of association between socio-demographic profile and economic crisis on milk consumption

Variable factors	Milk consumption during the economic crisis	
	X ²	p
Sex	0.494 ^a	0.781
Locality	8.156 ^a	0.017
Family size	22.218 ^a	0.014
The monthly income of the family	138.926 ^a	0.000
Guardian's education	29.217 ^a	0.000
Guardian's employment	37.182 ^a	0.000

X²-Pearson Chi-Square value; p<0.05-significant association between two variables

However, there was a significant association between milk consumption during the financial crisis and variables like location, family size, family income every month, guardian's educational attainment, and guardian's employment status. In contrast, 47.58% of respondents who live in rural areas said their milk consumption has declined and 60.53% of respondents who reside in urban areas said their milk consumption pattern has not changed. While the majority of respondents (84.62%) with a monthly income of less than Rs. 20,000 said their milk consumption has reduced whereas 76.47% of respondents with an income of more than Rs. 100,000 acknowledge that milk intake has not changed. According to Suheera and Wazeema (2023), female-headed families had high incomes and high food intake before the economic crisis. On the other hand, the majority of households headed by women said that high costs of products, low income, and lack of money had a significant negative impact on the amount of food consumed in their homes during the economic crisis. Because their guardian works a full-time job, the majority of responders (66.67%) did not change the quantity of milk they consumed. The consumption of milk was decreased by respondents (70.37%) whose guardians were unemployed. The predicted Pearson chi-square value for location, family size, monthly income, guardian education level, and guardians' work status has the highest value. It suggests that Sri Lanka's economic

crisis has a greater effect on undergraduates' milk consumption. Moreover, Haniffa *et al.* (2023) reported that the economic crisis significantly altered the purchasing power or intentions of consumers.

CONCLUSION

Most of the undergraduates consume both fresh milk and processed milk products. The milk consumption of undergraduates was impacted due to the economic crisis in Sri Lanka. The awareness of milk consumption was great among the undergraduates. The results of this study are useful in planning nutritional programs during the economic crisis for university students who are younger and in improving their nutritional awareness and status. To prevent unbiased consumption by undergraduates, it is crucial to provide a variety of milk and milk products available. Nevertheless, the availability and variety of milk products in the university canteen in Sri Lanka were not the focus of this study. It will be recommended that research be done on how students consume milk and how different the milk products are from the campus canteen. In order to create a meaningful picture of whether university undergraduates are eating a balanced, nutritious diet during their time in university, it is also advised that future research look into the consumption and purchasing trends of additional food items.

AUTHOR CONTRIBUTION

MFVN and STDDS conceptualized and designed the study. MFVN and PM performed the experiment and analysed the data. MP, STDDS, and VL supervised the study. MFVN, PM, MP, and VL drafted the manuscript and MFVN critically revised the manuscript.

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