

Effects of social influences on infant food consumption in the city of Ouagadougou (Burkina Faso): a retrospective survey

Sanogo BOUGMA (✉ bougma6@gmail.com)

University Joseph KI-ZERBO, Department of Biochemistry and Microbiology, Laboratory of Applied Biochemistry and Immunology (LaBIA)

François TAPSOBA

University Joseph KI-ZERBO, Department of Biochemistry and Microbiology, Laboratory of Applied Biochemistry and Immunology (LaBIA)

Judith Nomwendé SEMPORE

University Joseph KI-ZERBO, Department of Biochemistry and Microbiology, Laboratory of Biochemistry, Biotechnology, Food Technology and Nutrition (LABIOTAN)

Sibiri BOUGMA

University Joseph KI-ZERBO, Department of Biochemistry and Microbiology, Laboratory of Applied Biochemistry and Immunology (LaBIA)

Prudence DOUNIA

University Joseph KI-ZERBO, Department of Biochemistry and Microbiology, Laboratory of Applied Biochemistry and Immunology (LaBIA)

Laurencia Touloumdé SONGRE-OUATTARA

Research Institute of Applied Sciences and Technology (IRSAT)/ Department of Food Technology (DTA)

Aly SAVADOGO


University Joseph KI-ZERBO, Department of Biochemistry and Microbiology, Laboratory of Applied Biochemistry and Immunology (LaBIA)

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Abstract

Background

From the age of 6 months, children need, in addition to breast milk, a complementary food with nutritional composition that meets their needs. In addition, the lack of adaptation of some children to family feeding conditions could be sources of malnutrition. In Burkina Faso, little information is available on children's consumption of family foods. The objective was therefore to describe the feeding habits and frequencies of infants aged from 6 to 23 months.

Methods

The study consisted in collecting through a retrospective survey and analyzing dietary data of the last 24 hours. Sphinx V5, IBM SPSS Statistics 20.0 and XLSTAT 2016 were used to process the data.

Results

The dietary data of 618 children were collected. It was found that the most consumed foods were simple porridges (67.48%), cooked cereal doughs (65.70%), cookies and cakes (62.94%), juices and sweetened drinks (62.94%). The least consumed foods were cowpeas and peas (17.31%), improved porridges (13.92%) and eggs (6.63%). The most observed meal frequency was three meals per day (33.98%). Children having the minimum meal frequency per day was 86.41%. The principal component analysis showed a positive correlation between the consumption of imported infant flours, fish soups, fruits, juices and sweetened drinks, cookies and cakes, simple porridges, cooked cereal doughs with the social status of the mother. In addition, 55.72% of the children showed a preference for local infant formula porridges. The main reason given by responding mothers whose children did not consume infant formula was lack of information (57.75%).

Conclusion

In general, a high consumption of family-type meals with acceptable meal frequencies has been observed. In addition, a correlation between the types of food consumed and the social status of the parents was also found.

1. Introduction

The nutritional situation in Burkina Faso, as in other Sahelian countries, remains a cause for concern, particularly for young children [1]. The immediate causes of this situation are insufficient food intake. The fundamental factors of this inadequacy are low levels of education, high population growth, and general poverty among the population, particularly among women [2]. Inadequate and non-diversified nutrition leads to malnutrition [3, 4] and compromises the proper physical and intellectual growth of children [5]. According to some authors, malnutrition is most often caused by the lack of adaptation of certain individuals or groups of individuals to family feeding conditions [6]. Burkina Faso is composed of several ethnicities, languages, customs, and religions that live side by side on a daily basis and engage in common activities [7]. This results in a multitude of food practices and habits. Reflections on the socio-cultural link of food have been developed by some authors [8, 9] allowing for an understanding of the spatial and temporal differences of childhood malnutrition. Dietary learning begins at the onset of diversification with, in addition to the consumption of child-specific meals, the consumption of certain family foods [10]. According to some authors, the early consumption of family foods would prevent some food allergies that some children might develop [11]. Learning goes through a multitude of steps allowing the exploration of new textures, new tastes as well as the application of the appropriate gestures for feeding. Thus, for some authors, the learning process is a routine set of transmission of symbols and values that allow the child to integrate into the social group to which it belongs [12]. The child is therefore regularly brought into contact with a variety of foods and thus with a diverse palette of tastes. The child thus becomes familiar with the characteristic tastes of family food preparations throughout his development. These environmental influences on infant feeding have led some authors to conduct research and come to the conclusion that children's food preferences are influenced by genetics, by the environment in which they grow up and by the context in which they discover food [13, 14]. Other studies have also shown that the people around the child also play a considerable role in his food learning [15]. In Burkina Faso, very few studies have looked at the consumption of foods not specifically reserved for children in households. For this reason, this study was initiated to describe the eating habits and frequencies of children aged from 6 to 23 months in the city of Ouagadougou in order to get a picture of the situation at the national level on the issue of infant feeding in households. children aged from 6 to 23 months in the city of Ouagadougou in order to get a picture of the situation at the national level on the issue of infant feeding in households.

2. Materials And Methods

2.1 Survey area

The survey was conducted in maternity wards in the city of Ouagadougou during the period from March to June 2022. In terms of health, the city is divided into five (5) health districts with very different sizes of coverage and all five health districts were covered by the survey. The choice of the city of Ouagadougou was justified by the fact that it includes almost all the social groups of the different regions of the country, which makes it possible to obtain a picture of regional practices. In 2020, the child population of the city of Ouagadougou was estimated at 188,185 children aged from 0 to 2 years [16]. The urban commune of Ouagadougou is located in the province of Kadiogo in the Center region of Burkina Faso. Figure 1 illustrates the boundaries of the five health districts in the city of Ouagadougou.

2.2 Methods of data collection

An interview with the mothers of the children in the weighing and immunization centers was the main means of data collection. This interview was done through a collection forms designed using as a basis the WHO indicators for assessing infant and young child feeding practices [18]. The selection of mother-child pairs was carried out by the systematic sampling method. The general information collected was the name, the age of mother and child, the gender of the child, the marital status of mother, the education level and the occupation of the responding mothers. The recall of the last 24 hours was obtained from the responding mothers and allowed the collection of dietary information, including the description of the dishes consumed by the child the previous day and all ingredients used. During the survey, data were collected from 618 mother-child pairs. The error rate was 5% and the confidence coefficient was 1.96 for a confidence interval of 95%. The prevalence rate used in this study was 50%.

2.3 Target population and inclusion criteria

The population consisted of mother-child pairs. The inclusion criteria for the children were age (ranging from 6 to 23 months), health status (being in good health), attendance at a health center in the study area by the mother, and voluntary acceptance by the mother through an informed consent form.

2.4 Analysis of the data

Data were entered into Sphinx V5 software and then transferred to IBM SPSS statistics 20.0 software for the generation of numbers and frequencies. Graphs were produced on Microsoft Excel 2016 software. XLSTAT 2016 software was used to perform the principal component analysis and generate the P-values using Student's test. The threshold of statistical significance was set at $p < 0.05$.

3. Results

3.1 Consumption of different types of food according to the breastfeeding method

The results presented in Table 1 concern the consumption of different foods given to children by their mothers during food diversification. The consumption of fifteen types of food frequently given to children as well as family meals was evaluated. The results showed that simple porridges were the most consumed by the children followed by cooked cereal doughs. Cookies and cakes equally with juices and sweetened beverages as well as fruits were also much consumed. The least consumed foods were legumes, meat, tubers purees, cowpeas and peas, improved porridges and eggs. The comparison between the consumption of different foods according to the mode of breastfeeding shows significant differences concerning the consumption of local infant flours, improved porridges, cooked cereal doughs, tubers purees and fruits. When grouped according to the food groups proposed by the WHO for children, cereals were predominant in the children's diet, along with the consumption of family meals (cooked cereal doughs), cookies and porridges. Meat products (fish and meat soups) as well as fruits and sweet juices were also consumed to a large extent. Dairy products, legumes, legumins (cowpeas and peas), eggs and tubers purees were consumed to a small extent.

Table 1
Consumption of food types according to the type of breastfeeding

Type of food	Totals (N)%	Breastfeed (N = 590)	Non-breastfeed (N = 28)	P-value
Industrial milk	(206) 33.33	(178) 30.17	(28) 100.00	0.313
Imported infant flours	(280) 45.31	(274) 46.44	(6) 21.43	0.225
Local infant flours	(193) 31.23	(183) 31.02	(10) 35.71	0.045*
Simple porridges	(417) 67.48	(409) 69.32	(8) 28.57	0.251
Improved porridges	(86) 13.92	(82) 13.90	(4) 14.29	0.009*
Cookies and cakes	(389) 62.94	(380) 64.41	(9) 32.14	0.205
Fish soups	(254) 41.10	(240) 40.68	(14) 50.00	0.065
Meat soups	(142) 22.98	(137) 23.22	(5) 17.86	0.083
Eggs	(41) 6.63	(36) 6.10	5 (17.86)	0.710
Cowpeas and peas	(107) 17.31	(94) 15.93	(13) 46.43	0.290
Cooked cereal doughs	(406) 65.70	(387) 62.62	(19) 67.86	0.026*
Legumes	(158) 25.57	(140) 23.73	(18) 64.29	0.275
Tubers purees	(117) 18.93	(111) 18.81	(6) 21.43	0.041*
Fruits	(325) 52.59	(308) 52.20	(17) 60.71	0.048*
Juices and sweetened drinks	(389) 62.94	(381) 64.58	(8) 28.57	0.235
Legend : N : Number ; % : Frequency ; * : Significant level				

3.2 Consumption of different types of food according to the mother's social status

Principal component analysis of the different foods consumed by children shows various types of correlations according to the social status of the mother (Fig. 2). Consumption of imported infant formula, fish soups, fruits, juices and sweetened beverages, cookies and cakes, simple porridges, cooked cereal doughs were positively correlated with the mother's marital status, mother's education level, and mother's occupation. The results also showed a strong association between the consumption of cookies, cakes, simple porridges, sweetened juices and drinks, cooked cereal doughs with the status of married women, housewives, secondary education level women and women with higher education level. On the other hand, the children from women with no schooling level, from women with primary education level and from women in the informal sector are much more associated with the consumption of imported infant flours and fish soups, although the correlation is slightly weak. Single women were not strongly associated with the consumption of any food. In general, the consumption of eggs, improved porridges, cowpeas, tubers purees, meat soups, legumes, local infant flours and industrial milk did not show a positive correlation and were not associated with any social status of the mother.

3.3 Frequency of meal consumption by children

Of the total number of children, the results on meal frequencies show that 33.98% of children had a frequency of three meals per day while 5.99% of children had a frequency of one meal per day (Table 2). For breastfed children, those aged from 9 to 23 months had the highest meal frequencies compared to those aged from 6 to 8 months. Regarding minimum meal frequencies for all children, 86.41% received the minimum meal frequency per day. Specifically, 86.10% of breastfed children received the minimum frequency, including 34.24% of children from 6 to 8 months' group and 51.86% of children in the 9 to 23-month age group. As for the non-breastfed children, 92.86% had received the minimum frequency of four meals per day.

Table 2
Frequency of meals consumed according to the breastfeeding mode

Number of meals	Breastfed children (N = 590)		Non-breastfed (N = 28)	Totals (N)%	P-Value
	6–8 month	9–23 month	6–23 month		
One meal	(21) 3.56	(16) 2.71	(0) 0.00	(37) 5.99	0.01
Two meals	(65) 11.02	(45) 7.63	(0) 0.00	(110) 17.80	
Three meals	(78) 13.22	(130) 22.03	(2) 7.14	(210) 33.98	
Four meals	(23) 3.89	(71) 12.03	(7) 25	(101) 16.34	
Five meals	(28) 4.75	(76) 12.88	(12) 42.86	(116) 18.77	
Six meals	(8) 1.36	(29) 4.92	(7) 25	(44) 7.12	
Children having the minimum frequency*	(202) 34.24	(306) 51.86	(26) 92.86	(534) 86.41	
Legend : N: Number; %: Frequency;					
*For breastfed children. the minimum frequency is 2 meals per day for the 6 to 8 months age group and 3 meals per day for the 9 to 23 months age group and for non-breastfed children the minimum frequency is 4 meals per day [19]					

3.4 Children's reactions and mothers' perceptions about local infant porridges

The results presented in Fig. 3 showed that the majority of the children who consumed the local infant formula had positively reacted while less than fifty percent did not appreciate. The main finding was that the rate of positive appreciations was higher than the rate of disliking, although the difference was not significant. The cases of disgust with local infant formula were evaluated at 3.52%. Several reasons were given by responding mothers to explain the low level of consumption of local infant formula (Fig. 4). The majority of women interviewed mentioned lack of information about the availability of local infant formula, while a small proportion of women interviewed mentioned lack of resources, difficulty in cooking and lack of confidence. The remaining 31.34% of the women did not give any reason for not consuming.

4. Discussion

The results on the frequency of children consuming different types of food showed a high consumption of cereal-based foods such as simple porridges, cooked cereal doughs, imported infant porridges, local infant porridges and improved porridges. These results corroborate those of other studies that indicate a predominance of cereal-based food consumption with 80.45% of households consuming cooked cereal doughs in Burkina Faso [20] and 97% of children consuming cereals in Ivory Coast [21]. The low level of consumption of tubers could be justified by the high cost of these products, which are seasonal and were out of reach during the survey period. Cookies and cakes were heavily consumed by children, confirming the findings of other authors who also reported high consumption of cookies in France and Burkina Faso [22, 23]. The high consumption of cookies could be related to their great diversity, texture, variety of tastes, ease of use and conservation. The results on the consumption of juices, sweetened beverages and fruits in the present study showed a high frequency contrary to the results of [21] which revealed only 20% on this consumption in Ivory Coast. This high consumption of sweetened juices could be related to the preference of children for sweetened products [24] but also to their slightly acidic taste [25]. In general, meat products (meat and fish) are consumed at a low level, similar to other studies that found 32.7% of meat consumption in northern Burkina Faso [24]. Low consumption of these foods has also been noted among rural communities in Ethiopia [26]. According to some authors, such a diet low in meat products could result in micronutrient deficiency and lead to malnutrition [27]. To compensate for the low consumption of meat products, other authors also recommended the consumption of vegetables to ensure balance due to their protein and mineral composition [28]. However, the present study showed low consumption of vegetables and dairy products similar to other studies done in Ivory Coast [21, 29]. Cowpea consumption (17.31%) is lower than in another similar study conducted in Burkina Faso, which indicated between 48.3% and 44.7% of consumption of these products [24]. In general, eggs are consumed very little (6.63%). A recent study in Ivory Coast also found 14% of egg consumption [21]. The low consumption of eggs as well as meat could be of socio-cultural origin. Indeed, during the survey, some responding mothers mentioned the influence of these products on children's language learning and their behavior at adult age. The studies of Khalid et al. (2017) had also cased of the cultural aspect, allergies and lack of means in the low consumption of eggs in Ethiopia [30]. However, according to some authors, early and repeated exposure of children to different flavors, smells, and tastes of family meals would be an important factor that would promote future acceptability of foods at older ages and prevent some food allergies [11, 31, 32]. Of all the types of food consumed, only the consumption of cooked cereal doughs, local infant flour, improved porridge and fruit was significantly associated with the children's breastfeeding pattern. For most of the responding mothers, some foods such as cookies, cakes,

juices and sugary drinks, imported infant flours and fish were associated with the presence of vitamins in quantity, others such as cookies, cakes and porridge were associated with health recommendations and still others such as porridge and cereals doughs were considered to be ease of digestion. In this present study, the fact that the consumption of sweetened juices and drinks was strongly correlated with the situation of low-income housewives corroborates the results of Dubois, (2005) who found that the consumption of this type of food increases with the low income of the mother in Quebec [33]. The lack of a positive correlation between the consumption of certain foods and the social status of the mother could be explained by the existence of social stereotypes on the consumption of certain foods such as eggs, meat and cowpeas. This situation is largely fueled by the strong presence of the extended family in the care of newborns, the availability and accessibility of certain foods (industrial milk and derivatives) and the consumption habits of parents [24, 30, 34]. Results on meal consumption frequencies showed that 33.98% of the children surveyed consumed three meals per day. This result is lower than those of another similar study that indicated more than 40% of children with frequencies of three meals per day in Burkina Faso [35]. As for the finding on minimum meal frequencies, the result was satisfactory with 86.41% of children in general receiving the minimum meal frequency per day. However, this rate is lower than those obtained in a similar study in Ivory Coast with 99.00% of children receiving the minimum frequency of meals [21]. On the other hand, it is higher than those of another study conducted in Dakar, Senegal, which showed a minimum meal frequency rate of 71.3% [36] and that of the national nutrition survey in Burkina Faso, which showed a rate of 61.1% for the Central Region [37]. The high rate of children who received the minimum frequency of meals in this present study compared to those of the national nutrition survey could be explained by the difference in the survey area. The results of the national nutrition survey in the Central Region that included the surrounding villages, which often have different practices and cultures than the cities, could be the cause of the low rate observed. Indeed, these practices may contribute to the lower rate in the region as a whole. When comparing consumption frequencies, children aged 9 to 23 months generally have a higher frequency of meals per day and this may be related to the increase in the child's nutritional needs with age according to some authors [29, 38]. The results of this study noted that non-breastfed children (92.86%) were the most likely to receive the minimum meal frequency. This situation could be explained by the need to compensate for the absence of breastfeeding. Regarding the consumption of local infant porridges, the results showed that overall 55.72% of the children had positively reacted. This result is lower than that of another study carried out in the Gnagna province in Burkina Faso, which showed 66% of positive reactions [39], as well as those of [40], who showed that positive reactions ranging from 51.2–80% in Burkina Faso. The cases of disgust mentioned by the responding mothers could be explained in part by the food neophobia developed by some children during their food learning [41]. Other reasons such as differences in children's reactivity to different flavors [42] but also the lack of variation in meals over the course of the day could also be mentioned. Indeed, during the data collection, a great monotony in the children's meals such as the consumption of the same meal several times in the same day was noted. The reasons for not consuming the infant porridge were the lack of information on the availability of local infant formula, the lack of means, the preparation constraints and the lack of confidence. Another study conducted by GRET also cited the same reasons in Ouagadougou [39].

5. Conclusion

The objective of this study was to describe the feeding habits of children aged from 6 to 23 months in the city of Ouagadougou. The results showed that simple porridges, cereals doughs, cookies and cakes, juices and sweetened drinks were the most consumed. Cowpeas, improved porridges and eggs were the least consumed. The frequency of consumption was also high. Thus, more than one third of the children had a frequency of three meals while a small proportion of the children had a frequency of one meal per day. The minimum frequency of meals per day was received by a large majority of children. Depending on the mode of breastfeeding, the minimum frequency of meals per day was received by more non-breastfed children than breastfed children. Regarding the consumption of infant formula, more than half of all the children who consumed infant formula had positively reacted, whereas only a small proportion of children were disgusted by the local infant formula. Several reasons were given by responding mothers, including lack of information and, to a lesser extent, preparation constraints, lack of confidence and lack of resources. In general, we note a high consumption of family meals by young children. In order to further develop this study, an observational study would be necessary to confirm and consolidate the results obtained.

Declarations

Ethics approval and consent to participate

All methods were performed in accordance with relevant guidelines and regulations.

Before the study was carried out, an approval from Health Research Ethics Committee of the Ministry of Health of Burkina Faso was requested and obtained on January 5, 2022 with the following references (**DELIBERATION N°2022-01-013**).

All responding mothers were provided with the necessary information, study objectives, and survey methodology. Thus, each respondent mother gave informed consent to participate with her child in the study by signing an informed consent form before being included.

Consent for publication

Not applicable.

Availability of data and materials

The data used in this study are available from the corresponding author upon request.

Competing interests

The authors declare that there is no conflict of interest.

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Authors' contributions

All authors participated equally in designing the survey sheets, conducting the study, writing and editing the manuscript. All authors read and checked the final version of the manuscript.

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Author details

¹Laboratory of Applied Biochemistry and Immunology, (LaBIA)/UFR-SVT/ University Joseph KI-ZERBO, 03 PO Box 7021 Ouagadougou, Burkina Faso. ²Laboratory of Biochemistry, Biotechnology, Food Technology and Nutrition (LABIOTAN)/UFR-SVT/University Joseph KI-ZERBO, 09 PO Box 848 Ouagadougou, Burkina Faso. ³Department of Food Technology (DTA), Research Institute of Applied Sciences and Technology (IRSAT), 03 PO Box 7047 Ouagadougou, Burkina Faso.

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Figures

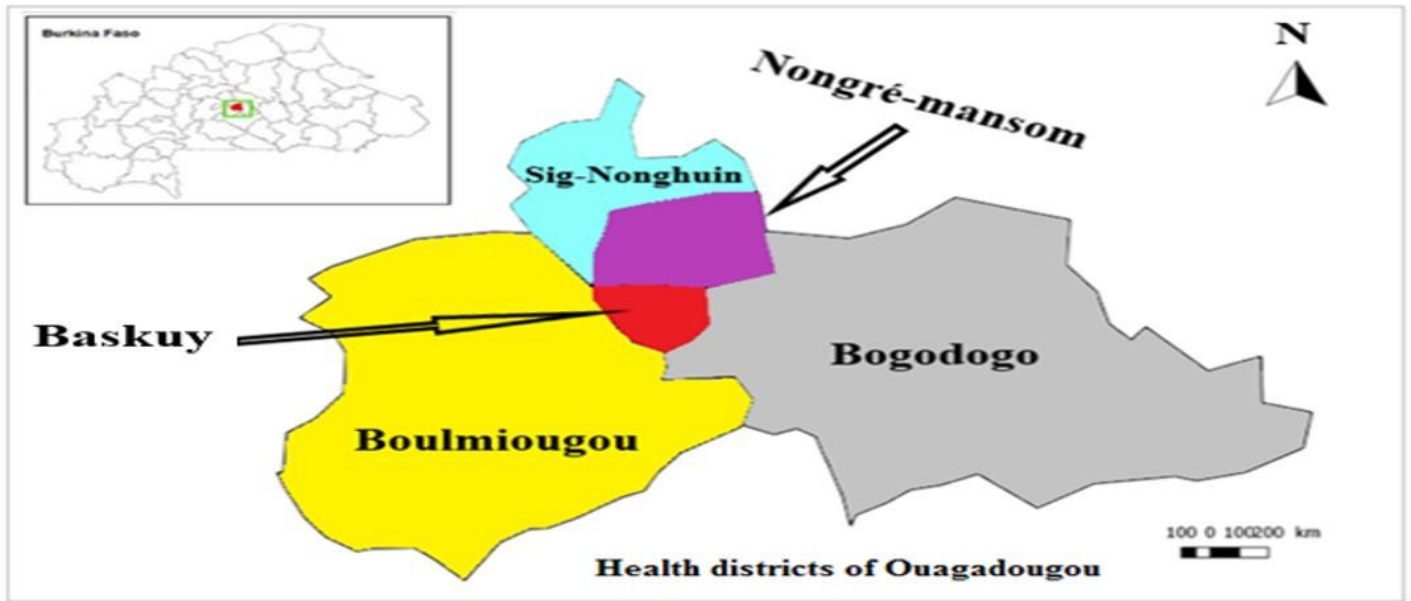


Figure 1

Health map of the city of Ouagadougou

Source : [17]

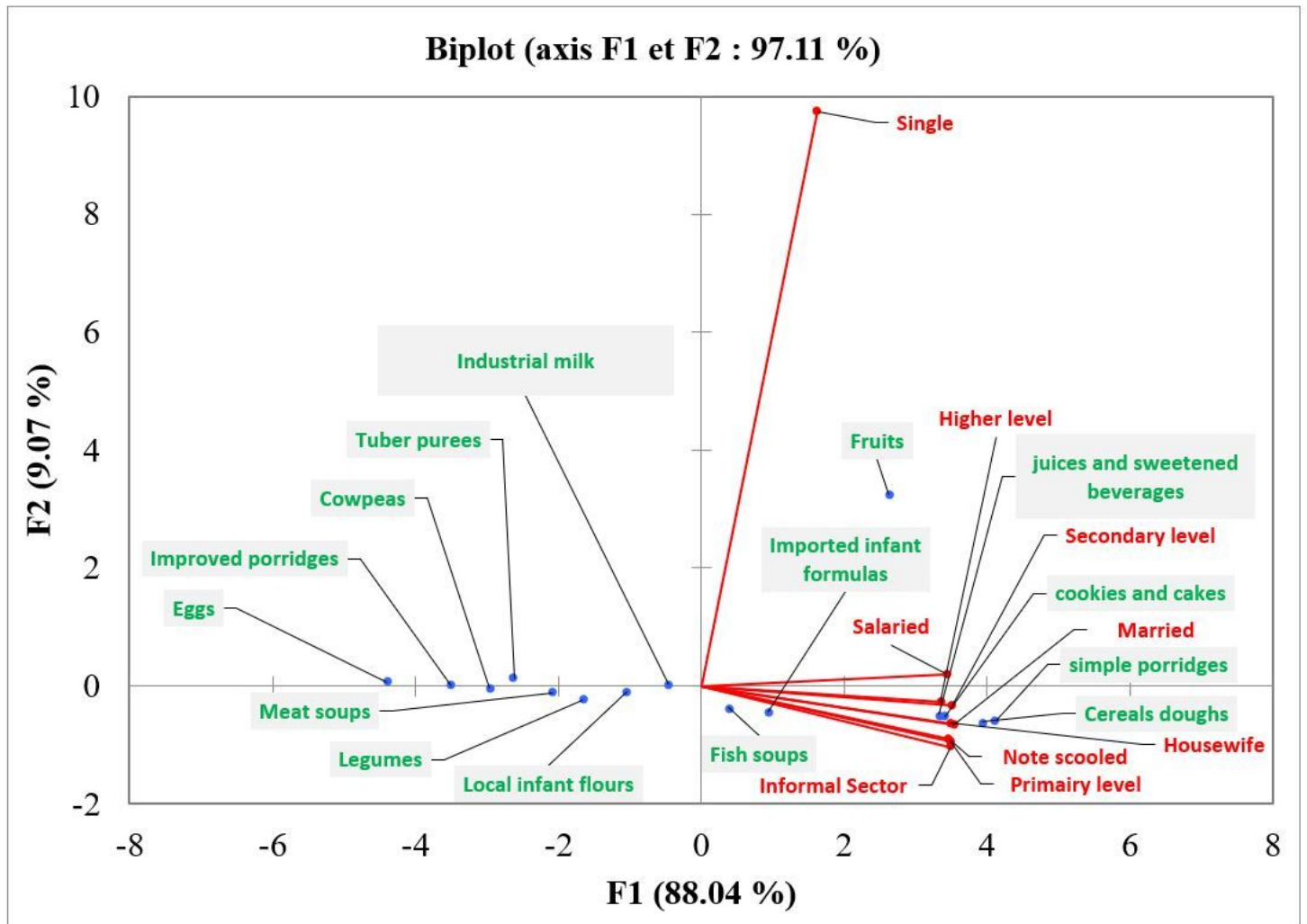


Figure 2

Principal Component Analysis of child food consumption according to the mother's social class

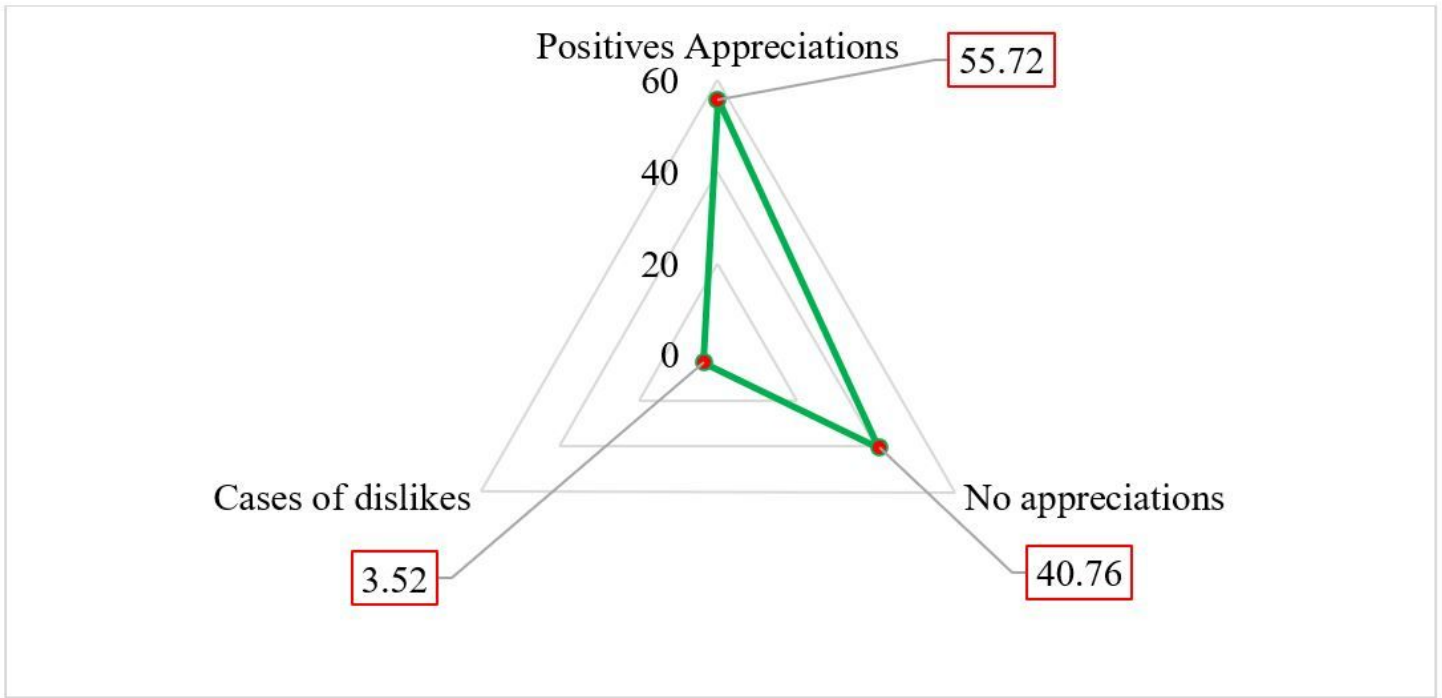


Figure 3

Children's reaction about local infant formula

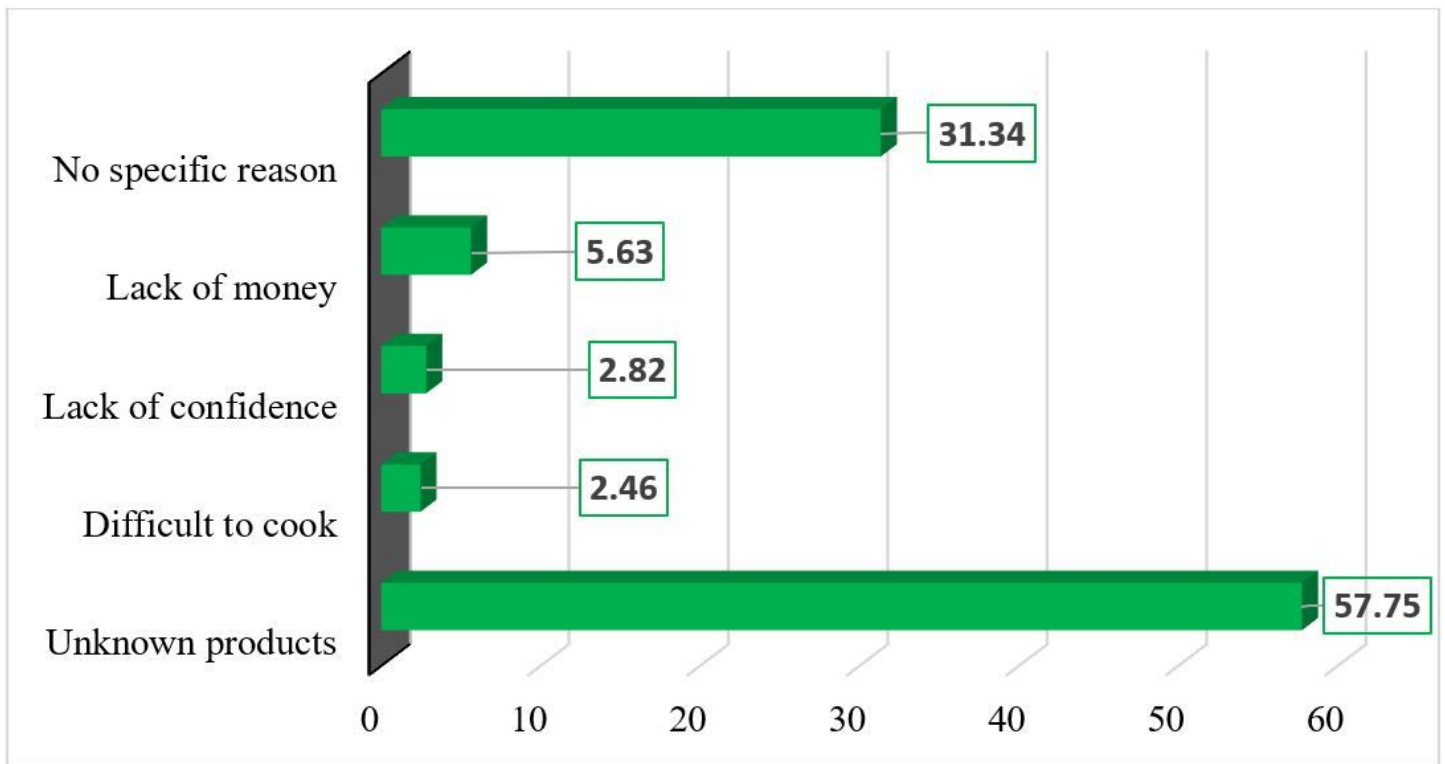


Figure 4

Women's perception about local infant formula