Nutrition and Food in Health and Disease Vol 12, No 1, Jan-Mar 2025, pages:23-30

Original Article

Food Supplementation Practices and Categorisation of Dishes Associated with Diets of Children Aged 6–36 Months in Rural areas of Man, Ivory Coast

Daouda Nimaga[1], Kamele Yao Kossonou[1], Kouakou Kouassi Armand Kouadio[1], N'guessan Georges Amani[2]

1- Agronomic, Forestry and Environmental Engineering Department, Laboratory of Food and Bioproduct Processes, University of Man, Côte d'Ivoire.

2- Laboratory of Food Biochemistry and Technology of Tropical Products, Department of Food Science and Technology, Nangui Abrogoua University, Abidjan, Ivory Coast.

Received: September 2024 **Accepted:** November 2024 2016

ABSTRACT

Background and Objectives: Inappropriate infant feeding practices are a contributing factor to malnutrition in western Côte d'Ivoire. In this region of the country, 26% of children under 5 years-old are malnourished and 6% of these children are emaciated. This study was carried out in women in the city of Man to assess knowledge and practices regarding infant feeding.

Materials and Methods: A descriptive cross-sectional survey of 240 women was carried out to assess their knowledge and practices regarding infant feeding. The sampling frame for the study covered eight rural localities in Man, including Kassiapleu, Petit Gbepleu, Gbangbegouine-Yati, Kouitongouine 1, Kouitongouine 2, Gbouakpale, Zele and Guianle.

Results: A majority of the women (75.4 %) started taking supplements 6–12 m with only 49.5%, receiving medical supports. They thought that the ideal age to stop was 12–24 m. The most commonly used foods for supplementation were cereal porridge (88.5%), kokonde (45.4%) and placali (36.3%).

Conclusions: Inappropriate supplementation practices were observed in nearly half of the children.

Keywords: Dietary diversification, Children, Breast milk, Ivory Coast

Introduction

During the first 6 m of a child's life, breast milk perfectly meets all the child's nutritional needs. Therefore, World Health Organization (WHO) and United Nations Children's Fund (UNICEF) Global Strategy on Infant and Young Child Feeding recommends exclusive breastfeeding for up to 6 m [1]. This prevents death of approximately 1.3 million children under the age of 5 years each year, which is a major problem in developing countries [2]. However, after 6 m of age, breast milk becomes insufficient in quality and quantity for infants, whose nutritional needs increase [3].

Feeding practices are key determinants of children's nutritional status, which affects their morbidity and mortality. In feeding practices, breastfeeding and the introduction of complementary foods are particularly important during the first two years of life [4]. Therefore, diets must progressively be diversified to help the infant make the transition from an exclusively milk-based diet to an adult diet [5]. The complementary feeding period is a period of high risk of deficiency. In several developing countries, infants and young children malnutrition and mortality are closely linked to often inappropriate complementary feeding practices [6]. Regarding importance of the quality of complementary feeding during this period, recommendations have been made based on the nutritional requirements of children at the age of introduction and for the development of nutritionally and healthily adequate infant formulae [7].

In Ivory Coast, studies into the socio-anthropological bases of malnutrition show that inappropriate feeding practices by mothers in the northwest of the country are at the root of malnutrition in children aged 0–5 y. In fact, people in these areas believe that certain local preparations in the form of maize porridge have nutritional and therapeutic qualities, on the pretext that they make children overweight [8]. In the regions of Ivory Coast, mothers' feeding practices are shaped by a system of thought characterised by ignorance, family beliefs, received ideas and other sociocultural factors [8]. The aim of this study was to assess knowledge and practices of women in the city

***Address for correspondence:** Daouda Nimaga, Agronomic, Forestry and Environmental Engineering Department, Laboratory of Food and Bioproduct Processes, University of Man, Côte d'Ivoire. E-mail address: daonimaga@yahoo.fr

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

of Man, Ivory Coast, regarding infant feeding. Moreover, maternal sociodemographic factors associated with complementary feeding practices in children aged 6–36 m in rural Man, Ivory Coast, was identified.

Materials and Methods

Fields of study

Man is a city with an area of 2.893 km^2, located in the west of Ivory Coast, 563.2 km from Abidjan and is the capital of the Tonkpi Region. It is located between 7°25'01" north latitude and 7°32'58" west longitude. Population of Man is estimated as 461.135 people, including 245.091 male and 216.044 female [9].

Survey sites

The study was carried out in eight rural communities in the District of Man, including villages of Kassiapleu, Petit Gbepleu, Gbangbegouine-Yati, Kouitongouine 1, Kouitongouine 2, Groupale, Zele and Guianle.

Survey on infant feeding practices

Selection of respondents

Women were selected using technique of snowball sampling. This is a non-probabilistic sampling method; in which, a respondent is selected at random and a list of other women is then compiled. Totally, 240 women were interviewed, including 30 women per village. Inclusion criteria were as follows:

- Women living in the village at the time of the survey.
- Women with children aged 0–36 m and knowledge of infant feeding practices.
- Women with children over 36 m and knowledge of children feeding practices.

Carrying out the survey

This study was a descriptive cross-sectional survey of 240 women, using questionnaires prepared using SPHINX Plus (V5) software. Sampling consisted of eight villages of Kassiapleu, Petit Gbepleu, Gbangbegouine-Yati, Kouitongouine 1, Kouitongouine 2, Gbouakpale, Zele and Guianle, all on the outskirts of the University of Man, Man, Ivory Coast. Data collection was carried out for a time period of approximately 1 m, 1–28 February, 2023, collecting information on sociodemographic characteristics, as well as mothers' nutritional practices and knowledge regarding the nutrition of their children.

Assessment of the biochemical compounds

Various analyses were carried out, including dry matter, ash, total lipids [10], total carbohydrates [11], proteins [12] and energy [13].

Statistical analysis

Two types of statistical analysis were used for data processing, including ANOVA variance analysis and Duncan's test for averaging. These analyses were carried out using SPSS software at 5% significance levels ($P \leq 0.05$).

Results

Sociodemographic characteristics of the women

Sociodemographic characteristics of the women are shown in Table 1. Most respondents were aged 15–74.5 years-old and married and 61.7% did not attend schools. Overall, 66.7% of the women were housewives and 70% belonged to Yacouba ethnicity.

Table 1. Sociodemographic characteristics of mothers in rural areas of Man, Ivory Coast

Characteristics	Full sample (n=250)	%
Marital status		
Single	49	20.5
Married	178	74.5
Widowed	12	5.02
Total		100
Age (year)		
[15-30]	109	45.4
] 30- 45]	111	46.3
> 45	20	8.3
Total		100
Level of study		
No instruction	148	61.66
Primary	70	29.17
Secondary	22	9.17
Total		100
Ethnic group		
Yacouba	163	70
Ivoirian non Yacouba	54	23.2
ECOWAS	16	6.9
Total		100
Profession		
Housekeeper	160	66.66
Shopkeeper	57	23.75
Artisan	20	8.33
Civil servant	03	1.25
Total		100

Characteristics of dietary supplements

Results of the survey showed that a majority of women (75.4 %) started supplementation at 6 m of age. However, more than 21% started supplementation before 6 m of age (Figure 1A). Moreover, 84.6% of these women thought that their infant was ready to receive foods other than breast milk (Figure 1B). In most cases (49.2%) they did not receive advices from a qualified person, although some (37.5%) received information from health professionals (Table 2). After the first supplementation, a majority of women (61.2%) reported that they no longer changed their infants' diets, while 38.8% of them provided other types of foods (Figure 1C). A majority of women (63.9%) changed their babies' diets from age of 12 m, compared with women (31.1%) who changed their babies' diets from age of 6–12 m, as shown in Figure 1D.

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

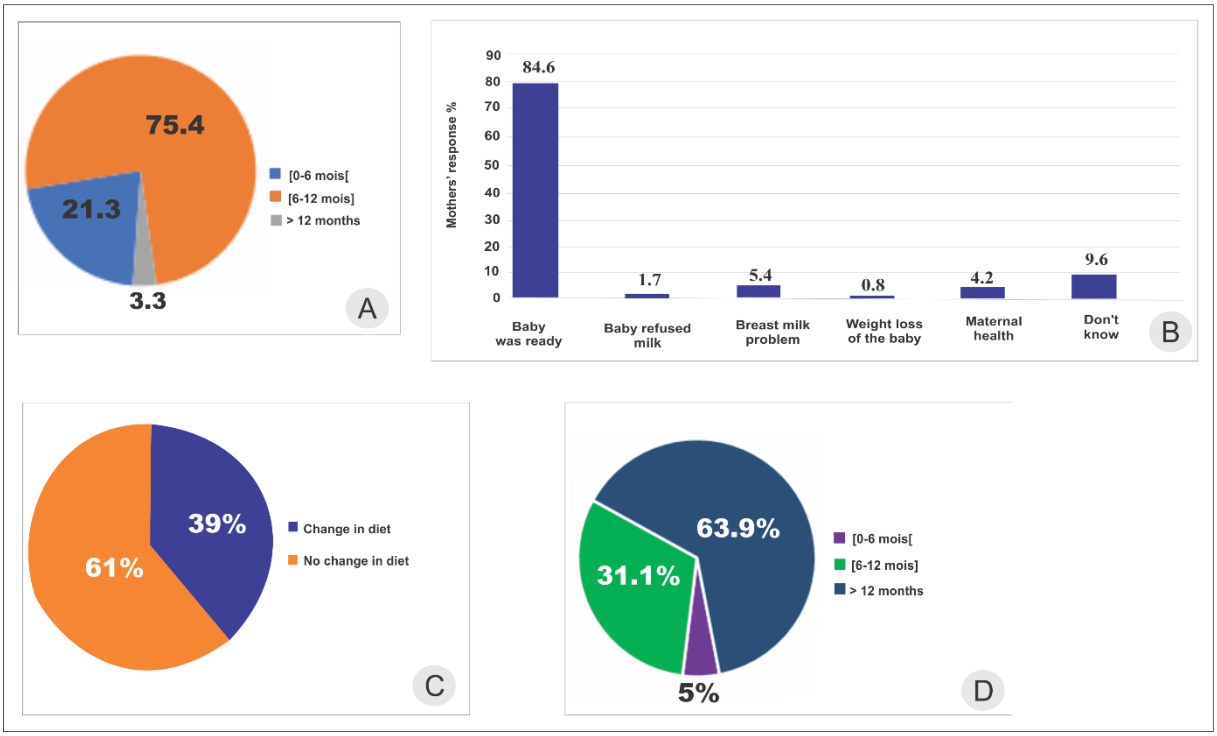


Figure 1. Characteristics of dietary supplements in rural areas of Man, Ivory Coast. A, Age of the introduction of local foods into diets; B, reasons for the supplementation of mothers; C, changes in the children's diets; and D, children's age for changes in their diets

Table 2. Distribution of women based on their sources of information on food supplements in rural areas of Man, Ivory Coast

Source of information	Full sample (n = 240)	%
None	118	49.2
Mother	19	7.9
Mother-in-law	09	3.8
Husband	03	1.3
Health worker(s)	90	37.5
Total		100

Identification of food supplements

Table 3 shows food supplements used in the diets of children aged 0–36 m. Nearly ten traditional foods in the children's diets were identified. In general, regardless of the age group, the major foods were cereal porridge (88.5%), kokonde (45.4%), placali (36.3%) and Cerelac (34.2%).

Weaning practices for the infants

The survey detected that 75.4% of mothers weaned their children at the ages of 12–24 m. Mothers who were asked about the weaning provided two major reasons, including 'it was the ideal time' (69.6%) and 'the baby refused the milk' (21.2%) (Table 4). The most common food used during weaning was rice (97.9%), followed by cassava-based dishes such as placali (71.7%), kokonde (44.2%) and cassava foutou (36.7%) (Table 5).

Method of the preparation of traditional dishes

Maize porridge (kpehibi bapou)

Flour used to prepare kpehibi bapou was prepared by grinding and sifting maize grains. This flour was toasted over a low heat and cooked in water to the desired consistency.

Rice porridge (mlinbi bapou)

Flour used to prepare mlinbi bapou was prepared after the rice grains were husked and sifted. This rice flour was mixed with boiling water and cooked in water.

Placali

First, cassava tubers were peeled and washed. Then, a ferment from fresh cassava stored in jute bags for 2–3 d was added to the tubers and mixed. This mixture was ground well. The resulting paste was set to ferment for 12 h, then drained and wrung out. Drained paste was then diluted with water and the mixture filtered in a metal pot. After 5 min, the filtrate in the pot was heated on the stove and the mixture was stirred with a spatula until a light mush was achieved, which reached a homogeneous consistency after 10 min. After additional 10 min, the cooked filtrate formed as a gelatinous mass and placali was served, packaged and preserved.

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

Table 3. Food supplements in diets of children in rural areas of Man, Ivory Coast, based on the age of the children

Local dishes	Full sample (n=240)	%
[0-6 month [		
Maize porridge (Kpêhibi bâpou)	37	15.4
Rice porridge (Mlinbi bâpou)	12	5
Cérélac (infant cereal)	15	6.3
Tôh	12	5
Placali	3	1.3
Foutou cassava	3	1.3
Vermicelli	8	3.3
Rice	17	8.3
[6-12 month [		
Maize porridge (Kpêhibi bâpou)	120	50
Rice porridge (Mlinbi bâpou)	38	15.8
Millet porridge	8	3.3
Cérélac (infant cereal)	67	27.9
Mashed potatoes (potato and potato)	20	7.5
Kokondé	29	20
Placali	31	12.9
Foutou	13	5.4
Vermicelli	48	20
Boiled yam	3	1.3
Attieke	5	2.1
Rice	44	37.1
12 month and more		
Maize porridge (Kpêhibi bâpou)	3	1.3
Kokondé	49	20.4
Placali	53	22.1
Foutou	14	5.8
Vermicelli	6	2.5
Attieke	3	1.3
Rice	124	51.7

Table 4. Distribution of mothers based on the reasons for weaning their children in rural areas of Man, Ivory Coast

Reason for weaning	Full sample (n=240)	%
Baby refuses mother's milk	51	21.2
Mother's unavailability	12	5
Advice from the husband	10	4.2
The perfect time	160	66.6
Don't know	7	2.9
Total		100

Table 5. Distribution of foods for weaning children in rural areas of Man, Ivory Coast

Dishes	Full sample (n=240)	%
Kokondé	106	44.2
Placali	172	71.7
Foutou cassava.	88	36.7
Foutou banana	21	8.8
Foutou yam	8	3.3
Vermicelli	25	10.4
Attieke	19	7.9
Rice	235	97.9

To (kokonde)

To of cassava, known locally as kokonde, is a dish prepared from cassava flour. Cassava pods were washed, dried and ground to achieve the flour. Nearly 4/5 of the water were heated to boiling. While boiling, 2/5 of the boiling water were removed from the pot and stored using container. The sieved cassava flour was gradually added to the boiling water, stirring with a spatula until a light porridge with an even consistency was achieved. After 10 min of cooking, 1/5 of the water was added to the light porridge and the mixture was vigorously stirred for nearly 15 min until thickening.

Physicochemical and nutritional characterisation of the local dishes

Cereal porridges

Physicochemical compositions of the maize (kpehibi bapou) and rice (mlinbi bapou) slurries are shown in Table 6. The ash content was low, 1 ±0.3 $g.kg^{-1}$ for kpehibi bapou and 2 ±2 $g.kg^{-1}$ for mlinbi bapou. Although dry matter content and pH of the two slurries were nearly similar, those of kpehibi bapou were relatively higher.

Placali and kokonde

Physicochemical compositions of placali and kokonde are shown in Table 6. The ash content was low, 79 ±2.4 $g.kg^{-1}$ for placali and 88.4 ±0.2 $g.kg^{-1}$ for kokonde. Although placali included the lowest ash content, it included the highest dry matter content (204.2 ±2.9 $g.kg^{-1}$).

Sludge nutritional parameters

Cereal porridges

Macronutrient contents and energy values of the porridges are listed in Table 6. Data showed that kpehibi bapou and mlinbi bapou included high carbohydrate contents of 854 ±5.6 and 814 ±5.4 $g.kg^{-1}$, respectively. The protein content of mlinbi bapou (128 ±5 $g.kg^{-1}$) was almost double that of kpehibi bapou (88 ±3.8 $g.kg^{-1}$). For lipids, kpehibi bapou included the relatively highest content (62 ±2.6 $g.kg^{-1}$), compared to mlinbi bapou (54 ±4 $g.kg^{-1}$). These macroelements provide these two dishes with high and almost identical energy values.

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

Table 6. Physicochemical and nutritional compositions of foods used in the diets of children in rural areas of Man, Ivory Coast

Local dishes	Maize porridge	Rice porridge	Placali	*Kokondé*
pH	5.5 ± 0.2 [a]	6.7 ± 0.3 [a]	4.4 ± 0.1 [a]	5.3 ± 0.1 [a]
Dry matter ($g.kg^{-1}$)	171.1 ± 6.2 [a]	145.5 ± 5.1 [a]	204.2 ± 2.9 [a]	191.8 ± 1.4 [a]
Ash ($g.kg^{-1}$)	1 ± 0.3 [a]	2 ± 2 [a]	79 ± 2.4 [b]	88.4 ± 0.2 [b]
Carbohydrates ($g.kg^{-1}$)	854 ± 5.6 [a]	814 ± 5.4 [a]	616 ± 7.2 [b]	603 ± 2.5 [b]
Protein ($g.kg^{-1}$)	88 ± 3.8 [a]	128 ± 5 [a]	257 ± 5.7 [b]	276 ± 2.3 [b]
fat ($g.kg^{-1}$)	62 ± 2.6 [a]	54 ± 4 [a]	48 ± 3.3 [a]	40 ± 0.9 [a]
Energy value ($Kcal.kg^{-1}$)	4302 ± 3.4 [a]	4284 ± 3.5 [a]	3930 ± 10 [b]	3858 ± 6.6 [b]

Means followed by the same letter in the same row are not significantly different at P = 0.05.

Placali and kokonde

Macronutrient contents and energy values of the dishes are shown in Table 6. Data showed that these two dishes were rich in carbohydrates (616 ±7.2 and 603 ±2.5 $g.kg^{-1}$, respectively). For proteins, kokonde (276 ±2.3 $g.kg^{-1}$) was richer than placali (257 ±5.7 $g.kg^{-1}$). For lipids, placali included the highest relative content (48 ±3.3 $g.kg^{-1}$), compared to kokonde (40 ±0.9 $g.kg^{-1}$). These macroelements provided these two dishes with high-energy values. Placali included more energy (3930 ±10 $kcal.kg^{-1}$) than that kokonde did (3858 ±6.6 $kcal.kg^{-1}$).

Discussion

Survey of infant feeding practices in rural Man revealed findings that highlighted the importance of promoting local dishes to improve the management of infant malnutrition in this region. From a sociodemographic point of view, survey showed that 74.5% of women were married and 66.7% were housewives with a high illiteracy rate (61.7%). These results were similar to those of Diallo, 2020 [14], who detected that 97% of the women were married and 61% did not attended school in her study on mothers' knowledge, attitudes and practices regarding the feeding of children aged 0–23 m and their nutritional status. A similar study by Diawara (2015) [15] detected that 96.2% of mothers were married, 92.9% were housewives and 65.3% did not attend schools. The high rate of women not attending school could be the result of several factors that reflect the rural reality; where, women generally have a few opportunities, under the effects of certain cultural practices.

Regarding the rate of supplementation of infant foods, age of starting foods was estimated at a rate of 75.4% at 6–12 m old. In the highlighted reasons, 84.6% of mothers thought that the baby was ready. These findings were similar to those of Gueye, 2012 [16], who detected that the age range was 6 m and above in 55.8% of cases. In addition, Mavuta et al. (2018) [17] detected that 92.42% of women started feeding of complementary foods for their children from the age of 6 m. The current values were similar to WHO standards [1], which recommend that complementary foods should only be added into young children's diets from the age of 6 m. In addition, the women did not receive any professional supports (49.5%) in managing infant feeding. This finding was in contrast to that of Traore et al. (2009) [18], who detected that 61.8% of mothers received advices from a health worker. This might reflect adherence to customary practices, which often contradict WHO recommendations and lack of information on appropriate feeding practices in early childhood. This information could be provided by a health worker, whose role is to explain how to introduce the first foods other than breast milk and to teach certain behaviours for the best development of the children.

Regardless of age group, the most commonly eaten dishes were cereal porridge (88.5%), kokonde (45.4%), placali (36.3%) and Cerelac (34.2 %). The current results could be explained by the fact that cereals are generally grown as staple crops in almost all regions of Ivory Coast. This is similar with the recommendations of the WHO (2003) [1], which advocates the introduction of semi-solid foods from 6 m of age for good feeding practices. In fact, the early introduction of foods (before 6 m) encourages competition with breast milk [19]; when, the babies' physiology does not allow them taking full advantages of these foods.

Regarding the age of weaning, a majority of mothers (75.4%) thought that the ideal age time for weaning was 12–24 m. In fact, all children should exclusively be breastfed from birth, at least for the first two years of life. For this reason, WHO (2003) [1] has recommended that children should exclusively be breastfed until 6 m of age until 2 y of age. Breastfeeding beyond 6 m is extremely important because it provides the children with micronutrients, vitamins and polyunsaturated fatty acids

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

(PUFA), which are detected at lower concentrations in cereal-based infant formulae [20]. In addition, 38.8% of mothers changed the foods they fed their children from the age of 12 m by introducing solid foods (family dishes) such as rice, placali, foutou manioc and toh. These results differed from those of Diadie in rural areas of Niger (2013) [21] on infant feeding practices, where introduction of family dishes was observed majorly in certain ethnic groups **(**Haoussa) before 6 m (53.2%) and 7 m (35.26%), respectively.

The low dry matter content (171.1 ±6.2 and 145.5 ±5.1 $g.kg^{-1}$) of the porridges did not meet the WHO recommended standard of 300 $g.kg^{-1}$ dry matter in infant porridges. However, the present values were higher than those (78 and 104 $g.kg^{-1}$) achieved by Hassane in 2006 [22] for fermented millet porridges in Burkina Faso. Indeed, the lesser the dry matter content, the more fluid in the porridge and hence the less energy of the food. Therefore, such porridges could lead to protein-energy deficiencies, potentially resulting in weight loss [23]. Regarding the nutritional value of these porridges, the carbohydrate content of 854 ±5.6 and 814 ±5.4 $g.kg^{-1}$, respectively for corn porridge (kpehibi bapou) and rice porridge (mlinbi bapou), exceeded the WHO/FAO recommendation of 68% for infants aged 6–12 m in porridges. The present results were similar to those of Carole et al. (2022) [24], who detected a carbohydrate content of 801.4 $g.kg^{-1}$ for millet porridge, 850.8 $g.kg^{-1}$ for kokobaka porridge and 795 $g.kg^{-1}$ for anagobaka porridge. This could be justified by the fact that rice and corn are starch-rich foods and by the large daily production quantities of porridges. This high carbohydrate content could lead to obesity, digestive disorders, pain and constipation in the children.

The protein (88 ±3.8 and 128 ±5 $g.kg^{-1}$) and lipid (62 ±2.6 and 54 ±4 $g.kg^{-1}$) contents of these porridges were lower than the WHO recommendations of 150 $g.kg^{-1}$ protein and 8% lipids in infant nutrition. The current results were differnt from those of Kouassi (2015) [23], who detected protein contents ranging 135–158 $g.kg^{-1}$ in porridges prepared from a mixture of sprouted corns and sorghums. Protein deficiency in the porridges could inhibit the children's growth. Additionally, lipids play an important role in satiety and weight gain. Foods low in lipids and energy promote weight loss.

The carbohydrate contents ranged 603 ±2.5 $g.kg^{-1}$ for kokonde to 616 ±7.2 $g.kg^{-1}$ for placali. These results were similar to those of Tchoko et al. (2011) [25], who achieved carbohydrate contents ranging 610–630 $g.kg^{-1}$ in cassava-based weaning flours. Since placali and kokonde are complementary foods, their carbohydrate contents meet the standard. Carbohydrates play an essentially energetic role and provide the body with the necessary energy. As for lipids, these various foods include relatively low contents ranging 48 ±3.3 $g.kg^{-1}$ (placali) to 40 ±0.9 $g.kg^{-1}$ (kokonde). These results were higher than those of Yeboue (2017) and Zoumenou (1994) [26, 27], who reported lipid contents of 0.91 and 0.4% for placali and kokonde, respectively. This lipid deficiency could lead to weight loss in children [28].

The protein contents varied 257 ±5.7 $g.kg^{-1}$ (placali) and 276 ±2.3 $g.kg^{-1}$ (kokonde). These results differed from those by Yeboue in 2017 [26], who detected protein contents of 10.9 $g.kg^{-1}$ (placali) and 15.3 $g.kg^{-1}$ (attieke). According to Diallo et al. (2013) [29], cassava is a protein-poor food. Therefore, these protein contents might be resulted from the use of frogs, protein-rich foods, based on the studies of Barros et al. (2008) [30]. These foods, frequently consumed by the populations of Man, are introduced into various accompanying sauces. These animal and plant resources could be used to address protein-energy nutritional deficiencies in children.

The energy value of cereal porridges (4302 ±3.4 $kcal.d^{-1}$) was higher than that of kokonde and placali, which were 3858 ±6.6 and 3930 ±10 $kcal.d^{-1}$, respectively. These results were similar to those of Tchoko et al. in 2011 [25], who reported values ranging 3900–3940 $kcal.kg^{-1}$ of cassava-based weaning flours. However, the present results were lower than those of WHO that recommends a total energy intake of 5500 and 12000 $kcal.kg^{-1}$ for children aged 6–36 m.

Conclusion

This study provides important data on dietary diversification in children aged 6–36 m in rural areas of Man, Ivory Coast, to enhance values of the local foods. Supplementation practices were inappropriate in nearly half of the children because food introduction occurred before the recommended age of 6 m. The age; at which, foods were introduced increased 6–12 m and the most commonly consumed foods included cereal-based porridges. Strategies aimed at improving maternal dietary behaviours are therefore needed to improve children's nutrition in rural areas of Man, Ivory Coast.

Conflict of interest

The authors declare no conflict of interest.

References

1. Organization, World Health, ed. Diet, nutrition and the prevention of chronic diseases: Report of a joint WHO/FAO expert consultation. Geneva: *World Health Organization*. 2003, vol. 916, p. 1-149. ISBN 924120916X.

2. United Nations Children's Fund (UNICEF). Progress for children: Achieving the MDGs with equity. New York: UNICEF, 2010. ISBN: 978-92-806-4537-8.

3. Dossa CPA., Keke M, Noudogbessi JP et al. Physicochemical and microbiological characterization of infantile flour produced based local products. *World Journal of Pharmaceutical Sciences*. 2014, 2(5), 422-427. ISSN (Print) : 2321-3310 ; ISSN (Online) : 2321-3086.

4. Essi MJ, Njoya O. L'enquête CAP en recherche médicale. (The KAP Survey in Medical Research). *Health sciences and*

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

Disease. 2013, 14(2), 3 p. https://doi.org/10.5281/hsd.v14i2.183. In French.

5. Arimond M and RUEL MT. Dietary Diversity Is Associated with Child Nutritional Status: Evidence from 11 Demographic and Health Surveys. *The Journal of Nutrition*. 2004, 134(10), 2579–2585. ISSN 1541-6100. https://doi.org/10.1093/jn/134.10.2579

6. Black RE, Makrides M, Ong KK *et al.* Subject Index. In: *Complementary feeding: building the foundations for a healthy life*. *Karger Publishers*. 2017, p. 201-204. ISBN: 978-3-318-059_55-7, eISBN: 978-3-318-05956-4

7. Tritscher A et al. Ensuring food safety and nutrition security to protect consumer health: 50 years of the Codex Alimentarius Commission. *Bulletin of the World Health Organization*. 2013, 91(7), 468–468A. ISSN 0042-9686. http://dx.doi.org/10.2471/blt.13.125518

8. Kone S, Adiko F, Agnissan AA. Milieu de provenance des mères nourrices et choix des modes d'alimentation des nourrissons dans le district d'Abidjan (Côte d'ivoire). (Environment of origin of nursing mothers and choice of infant feeding methods in the district of Abidjan (Ivory Coast)) *Revue Espace, Territoires, Sociétés et Santé*. 2020, 3(6), 169-185. In French.

9. RGPH. Recensement Général de la Population et de l'Habitat 2021. Résultats globaux. (General Population and Housing Census 2021. Overall results.) *Secrétariat Technique Permanent du Comité Technique du RGPH*. 2021, 37p. In French.

10. Association of Official Analytical Chemists. Changes in official methods of analysis. Arlington, Va: The Association, 1990. ISBN: 9780935584424, 0935584420

11. AOAC. Official methods of analysis (16th ed.). Arlington VA, USA: Association of Official Analytical Chemists. 1995.

12. Antia BS et al. Nutritive and Anti-Nutritive Evaluation of Sweet Potatoes (*Ipomoea batatas*) Leaves. *Pakistan Journal of Nutrition*. 2006, 5(2), 166–168. ISSN: 1680-5194. https://doi.org/10.3923/pjn.2006.166.168

13. Manzi P, Marconi S, Aguzzi A et Pizzoferrato L. Commercial mushrooms: Nutritional quality and effect of cooking. *Food Chemistry*. 2004, 84, 201–206.

14. Diallo M. Connaissances, attitudes et pratiques des mères sur l'alimentation des enfants de 0 à 23 mois et leur statut nutritionnel a la pédiatrie/Ureni Ducsref de Niafunke. (Knowledge, attitudes and practices of mothers on the diet of children aged 0 to 23 months and their nutritional status at the pediatrics/Ureni Ducsref of Niafunke.) Thèse unique de doctorat en médecine, Université des sciences des techniques et des technologies de Bamako, Mali**,** 2020, 33p. In French.

15. Diawara YD. Etude des facteurs associés à l'allaitement maternel exclusif chez les mères d'enfants de 0 à 6 mois à Beleko dans le District Sanitaire de fana. (Study of Factors Associated with Exclusive Breastfeeding in Mothers of Children Aged 0 to 6 Months in Beleko in the Health District of Fana.) University of Bamako, Bamako, Mali, 2015. DOI: 10.11648/j.ejpm.20210902.17. In French.

16. Gueye BY. Suivi nutritionnel des enfants de 6 à 59 mois et pratiques alimentaires des malnutris dans les communes de Zangaradougou et Danderesso. (Nutritional monitoring of children aged 6 to 59 months and dietary practices of the malnourished in the communes of Zangaradougou and Danderesso). Thèse de doctorat, Université des Sciences, des Techniques et des Technologies de Bamako, 2012.

17. Mavuta CZ, Imani WL, Ngimbi SL, Ngoie NL, Tshiswaka SM, Luboya ÉK, & Luboya ON. Infant feeding practices: Knowledge, attitudes and practices of mothers in an urban commune in the city of Lubumbashi, Democratic Republic of Congo. *Review of the Congolese nurse.* 2018, 2 (2): 109-116.

18. Tijou Traoré A, et al. Couples, PMTCT programs and infant feeding decision-making in Ivory Coast. *Social Science & Medicine*. 2009, 69(6), 830-837. ISSN 0277-9536. https://doi.org/10.1016/j.socscimed.2009.06.001

19. Treche S, De Benoist B, Benbouzid D *et al.* Complementary feeding of young children. 1995, *Paris: OMS/ORSTOM.*

20. Dillon JC. Progress in the world health status of children during the period 1990-2000. *Med Trop*. 2003, 63, 407-412. PMID: 14763295

21. Oumarou Diadie H, Doudou halidou M and Balla A. Etude de la stabilité et de l'acceptabilité du CSB $^{++}$ (Corn-Soya Blend) au Niger. (Study of the stability and acceptability of CSB++ (Corn-Soya Blend) in Niger). *International Journal of Biological and Chemical Sciences*. 2013, 6(6). ISSN 1991-8631. DOI: 10.4314/ijbcs.v6i6.18 . In French.

22. Hassan AB et al. Effect of Processing Treatments Followed by Fermentation on Protein Content and Digestibility of Pearl Millet (*Pennisetum typhoideum*) Cultivars. *Pakistan Journal of Nutrition*. 2005, 5(1), 86–89. ISSN 1680-5194. DOI: 10.3923/pjn.2006.86.89

23. AMOIN, AKKA et al. Comparaison des caractéristiques nutritionnelles et rhéologiques des bouillies infantiles préparées par les techniques de germination et de fermentation. (Comparison of the nutritional and rheological characteristics of infant porridges prepared by germination and fermentation techniques). *International Journal of Biological and Chemical Sciences*. 2015, 9(2), 944. ISSN 1997-342X. DOI: 10.4314/ijbcs.v9i2.31. In French

24. Carole KA et al. Microbiological and Nutritional Quality of Complementary Foods for Children (6 to 24 months) Produced in the City of Man (Côte d'Ivoire). *Microbiology Research Journal International*. 2022, 41–58. ISSN 2456-7043. doi: 10.9734/mrji/2022/v32i91344

25. Zannou-Tchoko VJ et al. Étude de la valeur nutritive de farines infantiles à base de manioc et de soja pour enfant en âge de sevrage. (Study of the nutritional value of infant flours based on cassava and soya for children of weaning age). *Bulletin de la Société Royale des Sciences de Liège*. 2011, 80, 748-758. https://popups.uliege.be/0037-9565/index.php?id=3231. In French

26. Yéboué KH et al. Valeur nutritive et propriétés organoleptiques de l'*attiéké*, de l'*attoukpou* et du *placali*, trois mets à base de manioc, couramment consommés en Côte d'Ivoire. (Nutritional value and organoleptic properties of attieke, attoukpou and placali, three cassava-based dishes commonly consumed in Ivory Coast). *Journal of Applied Biosciences*. 2017, 113(1), 11184. ISSN 1997-5902. https://doi.org/10.4314/jab.v113i1.7. In French

27. Zoumenou V. Etudes physico-chimique et nutritionnelle de quelques préparations alimentaires à base de manioc, (*Manihot esculenta, Crantz*). (Physico-chemical and nutritional study of some food preparations based on cassava *(Manihot esculenta Crantz)).* Doctoral dissertation, 3rd cycle thesis, 1994, Abidjan, Côte d'Ivoire. 117pp. In French.

28. Anigo KM, Ameh DA, Ibrahim S, Danbauchi SS. Nutrient composition of complementary food gruels formulated from malted cereals, soybeans and groundnut for use in North-

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]

western Nigeria. *African journal of food science*. 2010, *4*(3), 65-72.

29. Diallo MD et al. Soil suitability for the production of rice, groundnut and cassava in the peri-urban Niayes zone, Senegal. *Soil and Tillage Research*. 2016, 155, 412 - 420. ISSN 0167-1987. https://doi.org/10.1016/j.still.2015.09.009

30. Barros L et al. Wild and commercial mushrooms as source of nutrients and nutraceuticals. *Food and Chemical Toxicology*. 2008, 46(8), 2742–2747. ISSN 0278-6915. https://doi.org/10.1016/j.fct.2008.04.030

[Downloaded from nfsr.sbmu.ac.ir on 2026-11-12]

[DOI: 10.61186/nfsr.12.1.23]