

SENEGAL NUTRIENT PROFILING STUDY RESULTS REPORT

ARCH 3 - Nutrient Profiling Study

Using the 2019 WHO EURO
Commercially Available Complementary Foods Nutrient Profile Model
to assess nutrient composition and labelling practices
of commercially produced complementary foods purchased in
the Dakar and Guédiawaye Departments, Senegal

FINAL
August 2022

Contents

LIST OF ABBREVIATIONS	3
1. INTRODUCTION.....	4
2. AIM AND OBJECTIVES.....	5
2.1 AIM	5
2.2 OBJECTIVES	6
3. METHODOLOGY SUMMARY	6
3.1 STUDY DESIGN AND SAMPLING STRATEGY	6
3.2 DATA EXTRACTION	8
3.3 DATA ANALYSIS	10
4. RESULTS - PRODUCT CHARACTERISTICS (n=348).....	11
5. RESULTS: NUTRIENT COMPOSITION ASSESSMENT (n=329).....	13
5.1 DRY/INSTANT CEREALS/STARCHES (Category 1.1).....	13
5.2 PUREES (Categories 2.1 / 2.2 / 2.3 / 2.4 / 2.5 / 2.6 / 2.7).....	14
5.3 CHUNKY MEALS (Categories 3.1 / 3.2)	14
5.4 SNACKS/FINGER FOODS (Category 4.3).....	14
5.5 NUTRIENT COMPOSITION ASSESSMENT BY REGION OF MANUFACTURE.....	15
6. RESULTS: LABELLING PRACTICES ASSESSMENT (n=329)	18
6.1 PROTECTION AND PROMOTION OF BREASTFEEDING.....	18
6.2 CLAIMS.....	18
6.3 PRODUCT NAME AND INGREDIENT LIST CLARITY	18
6.4 MESSAGES ON PRODUCTS WITH A SPOUT	19
6.5 AGE RESTRICTION ON PUREED PRODUCTS.....	19
7. RESULTS: OVERALL NUTRIENT PROFILING OUTCOMES (n=348)	22
8. RESULTS: LABORATORY VERSUS LABEL NUTRIENT VALUES.....	23
9. CONCLUSION	28
10. REFERENCES.....	29
ADDENDA.....	31
Addendum 1: Types and definitions of claims assessed for as part of the Draft NPM assessment.	31
Addendum 2: Comparison of nutrient values per product: Declared label value (DV) and laboratory measured value (LV)	32

LIST OF ABBREVIATIONS

ARCH	Assessment and Research on Child Feeding
CACF	Commercially available complementary foods
CPCF	Commercially produced complementary foods
DHS	Demographic and Health Survey
Draft NPM	2019 WHO EURO Commercially Available Complementary Foods Nutrient Profile Model
IYCF	Infant and young child feeding
IQR	Interquartile ranges
LMIC	Low and middle-income countries
MAD	Minimum acceptable diet
MDD	Minimum dietary diversity
MMF	Minimum meal frequency
NPM	Nutrient profile model
RTE	Ready-to-eat
UNICEF EAPRO	United Nations Children's Fund East Asia and Pacific Regional Office
WHA	World Health Assembly
WHO	World Health Organization

1. INTRODUCTION

A window of opportunity exists during the first 1000 days of life when appropriate early nutrition interventions can help prevent malnutrition in children and establish positive dietary habits that carry on into adulthood (1). Investment in optimal feeding during this time can improve national and global economy by means of human capital improvement (2), whereby USD1 spent on nutrition can have a USD16 economic return (3). Evidence shows that dietary preferences later in life can be influenced by early childhood food consumption, and habits developed during this time can carry over into adulthood (4). Early childhood is therefore an opportune time to navigate adolescent and adult health outcomes, and close attention needs to be paid to the food environment of older infants and young children.

The World Health Organization (WHO) states that optimal infant and young child feeding (IYCF) includes exclusive breastfeeding from birth to six months, with appropriate complementary feeding and continued breastfeeding thereafter (5,6). Complementary foods introduced to the older infant's diet must contain optimal amounts of nutrients to meet their growing needs and limited gastric capacity (7). Complementary foods thus need to be nutrient dense, particularly in the micronutrients that are critical for growth and development, including iron, zinc and vitamin A, but whose intake is often limited in the diets of older infants and young children in low and middle-income countries (LMIC) (8,9).

Complementary foods can be home-prepared, but are now often commercially produced. Commercially produced complementary foods (CPCF) can vary widely in nutritional quality. Some CPCF may improve nutrient intakes by providing critical micronutrients that may be limited in the diets of young children, while others are of concern because they contain high levels of added salt or sugar or contain industrially produced trans fatty acids or pro-inflammatory additives (10,11). WHO guidelines recommend the use of low-cost, fortified, CPCF in some circumstances, but these products must be promoted in a way that protects breastfeeding and the consumption of diverse diets based on locally available foods (12). Inappropriate promotion of CPCF can mislead and confuse caregivers about the nutritiousness and health-related qualities of these products and their appropriate, safe use. Appropriate product labelling, a form of marketing promotion, is essential to provide the consumer with necessary information on product use, health, safety and nutrient levels (13). In many LMIC, exclusive and continued breastfeeding rates are below the globally recommended levels and there is often minimal or weak national legislation to protect optimal IYCF practices, and few national legislations direct what constitutes the appropriate promotion of CPCF.

The World Health Assembly (WHA) Resolution 69.9 urges countries to end the inappropriate promotion of foods for infants and young children. The WHO Guidance on Ending the Inappropriate Promotion of Foods for Infants and Young Children (hereafter referred to as WHO Guidance) that was warmly welcomed as part of WHA resolution 69.9, states in recommendation 3: "*Foods for infants and young children that are not products that function as breast-milk substitutes should be promoted¹ only if they meet all the relevant national, regional and global standards for composition, safety, quality and nutrient levels and are in line with national dietary guidelines*" (14).

¹ *'Promotion is broadly interpreted to include the communication of messages that are designed to persuade or encourage the purchase or consumption of a product or raise awareness of a brand. Promotional messages may be communicated through traditional mass communication channels, the Internet and other marketing media using a variety of promotional methods. In addition to promotional techniques aimed directly at consumers, measures to promote products to health workers or to consumers through other intermediaries are included. There does not have to be a reference to a brand name of a product for the activity to be considered as advertising or promotion'* (14).

To fully implement this recommendation, national, regional and global standards for composition, safety, quality, nutrient levels and labelling practices for these products are needed. Products need to be evaluated against these standards to determine their suitability. Recommendation 3 of the WHO Guidance further encourages that “*Nutrient profile models should be developed and utilized to guide decisions on which foods are inappropriate for promotion*”. Nutrient profiling is the science of classifying or ranking foods according to their nutritional composition for reasons related to preventing disease and promoting health and can be used as a guide to restrict promotion of unhealthy products, including those marketed to children (15). The WHO Regional Office for Europe took the first step to develop a nutrient profile model specific to CPCF marketed as suitable for older infants and young children (6–36 months), and in 2019 published the ‘Draft WHO EURO Commercially Available Complementary Food² Nutrient Profile Model’ (hereafter referred to as the Draft NPM) (16). This study utilized the Draft NPM to assess CPCF products available in Senegal, a first for Africa, and a valuable first step in assessing whether such a model could be suitable for use in LMIC in West Africa.

Childhood malnutrition remains a challenge in the Senegal context. The 2019 Demographic and Health Survey (DHS) (17) indicates that stunting,³ underweight,⁴ wasting,⁵ and overweight⁶ affect 17.9%, 14.4%, 8.1% and 2.3% of children under-five, respectively. Complementary feeding among young children in Senegal needs to be improved. Only 23.3% of children 6 to 23 months of age achieve minimum dietary diversity (MDD), 36.9% minimum meal frequency (MMF), and 10.0% minimum acceptable diet (MAD) (17). Consumption of foods high in vitamin A and iron was found to be higher amongst children 6 to 23 months of age from rural areas than for children of the same age in urban areas (60.9% and 46.6% compared to 54.9% and 44.5% respectively in urban Senegal). Intake of foods high in vitamin A and iron positively correlated with the child’s age, with children 18-23 months of age being up to 5 times more likely to consume foods high in vitamin A and iron compared to older infants 6-8 months of age. CPCF are readily available and consumed in the Dakar Department. Eighty-four CPCF (purees, infant cereals, juices/waters and snack/finger foods) were found available for sale in Dakar Department (18). A situation analysis also conducted in Dakar Department found that 49.1% of 218 children 6–23 months of age ate a CPCF on the previous day, as reported by their mothers (19).

2. AIM AND OBJECTIVES

2.1 AIM

This study evaluates whether available CPCF meet the Draft NPM thresholds and requirements for both nutrient levels and labelling practices, with the aim to assist the Senegalese Government with efforts to restrict inappropriate promotion of foods for older infants and young children in Senegal. In addition, the study aims to add to the global body of evidence regarding nutrient composition and labelling practices of CPCF and their compliance with selected recommendations of the WHO Guidance (part of WHA 69.9).

² The terms *commercially available complementary food* (CACF) and *commercially produced complementary foods* (CPCF) are used interchangeably in this study.

³ Height-for-age z-scores <-2 SD with respect to the WHO 2006 Growth Standards.

⁴ Weight-for-age z-scores <-2 SD.

⁵ Weight-for-height z-scores <-2 SD.

⁶ Weight-for-height z-scores >2 SD.

2.2 OBJECTIVES

1. To **assess the nutrient composition** of CPCF sold in a peri-urban and urban area of Senegal against the nutrient composition thresholds of the Draft NPM.
2. To **assess the labelling practices** of CPCF sold in a peri-urban and urban area of Senegal against the labelling requirements of the Draft NPM.
3. To **benchmark** the number of CPCF that complied with both the nutrient composition thresholds and labelling requirements of the Draft NPM.
4. To **compare** the content of selected nutrients, as determined by laboratory assessment, of a sub-sample of the most commonly available CPCF in a peri-urban and urban area of Senegal to the nutritional information declared on their labels.

3. METHODOLOGY SUMMARY

3.1 STUDY DESIGN AND SAMPLING STRATEGY

In this cross-sectional survey, CPCF (defined in Box 1) purchased in May-June 2021 in the Guédiawaye and Dakar Departments, Senegal, were subject to nutrient composition and labelling practices assessments to determine adherence to the Draft NPM. A sub-sample was subject to laboratory analysis to compare nutrient content and declared nutritional information.

Box 1. Definition of CPCF used in this study

Commercially produced complementary foods (CPCF) are all commercially produced foods and beverages that are specifically marketed as suitable for feeding older infants and young children if they meet at least one of the following criteria:

1. Are recommended for introduction at an age of less than 3 years.
2. Are labelled with the words: 'baby', 'infant', 'toddler', 'young child', or synonym.
3. Have a label with an image of a child who appears to be younger than 3 years of age or who is feeding with a bottle; or
4. Are in any other way presented as being suitable for children under the age of 3 years. (14,16)

Purchasing CPCF for nutrient profiling

Store scoping and selection was undertaken to obtain a wide variety of CPCF products available for purchase in the study sites. In the Dakar Department, researchers compiled a list of larger stores⁷ (chain/independent; national/international) including supermarkets, hypermarkets and pharmacies. The independent stores identified were exhaustively sampled. Among chain retailers, the store that stocked the greatest variety of CPCF products was purposively sampled.

In peri-urban Guédiawaye Department, store scoping found that CPCF points of sale included only one larger store (a supermarket), and four types of smaller stores (superettes, small pharmacies, gas station boutiques and neighbourhood boutiques). Only a small number of superettes and gas station boutiques were identified across all communes and were thus exhaustively sampled.

⁷ The ARCH 1 study conducted in Dakar Department in 2013 (18), which visited 9 purposively sampled larger stores and 22 randomly sampled smaller stores, showed that 99.0% (n=83/84) of CPCF available for purchase in the Dakar Department were available at the larger stores. Thus, only larger stores were purposively sampled for the Dakar Department in this study.

Each commune was found to have numerous pharmacies and neighbourhood boutiques, and so the two largest pharmacies and neighbourhood boutiques per commune were purposively sampled.

Table 1 presents the number of stores visited in the Dakar and Guédiawaye Departments. With the exception of two neighbourhood boutique stores, all stores visited sold CPCF. A total of 10 larger stores were visited in the Dakar Department; 31 stores (1 larger, 30 smaller) were visited across the five communes of the Guédiawaye Department.

Table 1: Number and type of stores visited in the Dakar Department and per commune in the Guédiawaye Department (n=41)¹

Study sites	All Stores	Larger stores		Smaller stores			
		Supermarket/hypermarket	Pharmacy	Superette	Gas station boutiques	Pharmacy	Neighbourhood boutiques
Dakar Department	10	7 (70.0%) ²	3 (30.0%) ³	0	0	0	0
Guédiawaye Department	31	1 (3.2%)	0	5 (16.1%)	3 (9.7%)	10 (32.3%)	12 (38.7%)
Golf Sud	8	1	0	3	0	2	2
Sam-Notaire	6	0	0	1	0	2	3 ⁴
Medinas Gounass	5	0	0	0	1	2	2
Ndiarème-Limamoulaye	6	0	0	0	1	2	3 ⁴
Wakhinane-Nimzatt	6	0	0	1	1	2	2
Total stores visited	41	8 (19.5%)	3 (7.3%)	5 (12.2%)	3 (7.3%)	10 (24.4%)	12 (29.3%)

¹Presented as: n (% of all stores visited).

²Included: 1 wholesale store (independent national); 6 retail stores (1 independent international; 3 chain international; 2 chain national).

³Included: 3 independent national retail stores.

⁴One neighbourhood boutique store visited did not sell CPCF and so an additional neighbourhood store was visited in the same commune.

CPCF products were purchased in sampled stores so label information could be extracted for analysis. One of each unique CPCF product was purchased from the first store at which it was encountered. Products carrying the same brand name but different sub-brands, descriptive names, age recommendations, age categories or made by different manufacturers were treated as a unique product and purchased. Different flavours (but not different package sizes/containers) of the same product were also treated as a unique product (since their nutrient content could vary) and purchased.

While in store, every product purchased was allocated a unique code. Additional product details were also recorded while in stores, including: the product's full name (i.e., brand, sub-brand, descriptive name and flavour variant), manufacturer, age recommendation, age category, net weight, price per net weight, date of purchase, and store where purchased.

Purchasing CPCF for laboratory analysis

After all available products were purchased, a sub-sample of CPCF was selected for laboratory analysis and additional units of the selected products were purchased from at least two of the previously visited stores (except where products were only available at one store) to send to the laboratory.

CPCF were selected from each of the following Draft NPM overall categories: 1: Dry, powdered and instant cereal/starchy food; 2: Soft–wet spoonable, ready-to-eat foods; 3: Meals with chunky pieces; 4: Dry finger foods and snacks⁸. In each product category, one product was selected per manufacturer (the most commonly available product for that manufacturer across the stores visited).

Manufacturers with products available from only one store were excluded, with the exception of dry finger foods and snacks category where all products were available in one store only. This resulted in the selection of 24 CPCF across the four categories.

Six units of each product were purchased with different batch numbers, if available, and a minimum expiry date of three to four months from purchase. No additional units were available for purchase for three dry finger foods/snack products and thus they were excluded, resulting in a total of 21 CPCF being sent for laboratory analysis. All units of CPCF were coded and sent to the internationally recognized laboratory selected (compliant with International Standard ISO/IEC 17025:2017) and contracted for analysis of energy and nutrient content. A composite sample was created by combining all six units of each product for one pooled product sample to undergo laboratory analysis.

As per the nutrients of interest to the study, the product contents that were analysed included: energy; protein; total fat; trans fat; saturated fat; total carbohydrate; total sugar; sodium; and micronutrients of interest (iron, zinc and calcium). Results were provided by the laboratory per 100g of the product as sold.

3.2 DATA EXTRACTION

The labels of all CPCF purchased were photographed or scanned according to the standard operating procedure used previously in Senegal (18,20), and images uploaded to a central digital folder in Dropbox. CPCF that did not provide a declaration of nutrition information and an ingredient list on the label in English, French (the official language of Senegal) or Wolof were excluded from the study. Label information provided in French/Wolof took precedence over English text.

General product and purchase information recorded manually in the field was transferred to Microsoft Excel. This data was checked and additional data extraction (country of manufacture, preparation type, packaging, label language and storage type) was performed using the product label images. Product names and ingredients were reviewed, and all CPCF were placed in one of five overall product categories (16 subcategories) proposed in the Draft NPM (Table 2). Products that did not fit into these categories were excluded from the study.

⁸ The following CPCF were excluded from selection: a) Products excluded from the study; b) Category 5 products (Juices and other drinks); c) Perishable products.

Table 2: Product categories proposed in the Draft NPM

Category 1: Dry, powdered and instant cereal/starchy food	
Category 1.1	Dry or instant cereals/starches
Category 2: Soft–wet spoonable, ready-to-eat foods, typically smooth or semi-puréed packaged in jars or pouches and can be spoon-fed	
Category 2.1	Dairy-based desserts and cereal products
Category 2.2	Fruit purée with or without addition of vegetables, cereals or milk
Category 2.3	Vegetable only purée
Category 2.4	Puréed vegetables and cereals
Category 2.5	Puréed meal with cheese (but not meat or fish) mentioned in the name
Category 2.6	Puréed meal with meat or fish mentioned as first food in product name
Category 2.7	Puréed meals with meat or fish (but not named first in product name)
Category 2.8	Purées with only meat, fish or cheese in name
Category 3: Meals with chunky pieces, often sold in trays or pots for older infants and young children	
Category 3.1	Meat, fish or cheese-based meal with chunky pieces
Category 3.2	Vegetable-based meal with chunky pieces
Category 4: Dry finger foods and snacks	
Category 4.1 ¹	Confectionery, sweet spreads and fruit chews
Category 4.2	Fruit (fresh or dry whole fruit or pieces)
Category 4.3	Other snacks and finger foods
Category 5: Juices and other drinks	
Category 5.1 ¹	Single or mixed fruit juices, vegetable juices, or other non-formula drinks
Category 5.2 ¹	Cow's milk and milk alternatives with added sugar or sweetening agent

¹ Should not be marketed as suitable for infants and young children < 36 months.

To conduct the nutrient composition assessment, the declaration of nutrition information per 100g of the product as sold⁹, serving size and ingredient list were extracted into Microsoft Excel from the product label images. Extracted data (general information, ingredient list and nutrition information) underwent cleaning and a 10.0% error check against the label images, resulting in an accepted error rate of 1.5% and error corrections being applied to the full dataset.

For label text that was captured verbatim during data extraction (product name and ingredient list), French/Wolof speaking researchers translated the text from French/Wolof to English, thus capturing the information in English only. Translations were verified during the 10.0% error checks using Google Lens.

For the labelling practices assessment, two researchers independently carried out data extraction from the product label images by answering a series of questions and entering required label information into the Labelling Practices Assessment Microsoft Excel datasheet. The labelling practices assessment included questions regarding claims; age recommendations; text/images implying product is suitable for infants under 6 months old; breastfeeding messages; bottle feeding messages/images; warnings required for products with a spout; ingredient list; product name.

A comparison of the double data entry was conducted, and all inconsistencies reviewed and corrected. The final dataset underwent a 5.0% error check, resulting in an accepted error rate of 2.6% and error corrections being applied to the full dataset.

⁹ Nutrition information per serving of the product as sold and/or as percentage of the nutrient reference values used by Senegal (or other reference values as used in the country of origin for imported products, with country of origin noted) was extracted if the information was not available per 100g.

3.3 DATA ANALYSIS

The Microsoft Excel datasheets containing the verified extracted general data, nutrient composition data and labelling practices data were used for assessment against the Draft NPM. Products that should not be marketed as suitable for infants and young children < 36 months, according to the Draft NPM (product categories 4.1 and 5), were not assessed against the nutrient composition or labelling practices assessment but were counted in the overall Draft NPM outcomes as having automatically failed the NPM.

Nutrient Composition Assessment

The labels of CPCF were assessed against the Draft NPM to determine adherence to nutrient composition thresholds. Following product categorization, the ingredient list and nutrient content of products were cross-checked against category-specific nutrient/ingredients thresholds. In cases where product labels were missing nutrient content information for nutrient composition thresholds, these products were unable to pass that specific nutrient assessment.

A product was classified as nutritionally suitable for older infants and young children if it fell within all category-specific nutrient thresholds.

The Draft NPM requires products to provide a front-of-pack 'high sugar' warning if the percentage energy from total sugar exceeds category specific thresholds. The labels of CPCF were assessed against this requirement and the results presented separately, with the exception of category 4.3 snacks/finger foods, as this requirement does not contribute to a pass/fail result for the nutrient composition assessment.

Analysis of the CPCF products' performance against the Draft NPM was conducted using pre-designed Microsoft Excel spreadsheets developed by a team of researchers at Leeds University in collaboration with the WHO Regional Office for Europe. Statistical analysis was conducted in Stata 14. Descriptive statistics were calculated and summarized using proportion and medians with interquartile ranges (IQR) for nonnormally distributed data.

Labelling Practices Assessment

The Labelling Practices Assessment Excel datasheet contained a series of questions based on the Draft NPM labelling requirements, some of which were product category or packaging-specific. This Excel datasheet was used to classify each product as suitable for promotion for older infants and young children if it met all relevant labelling requirements. Analysis of the CPCF products' performance against the Draft NPM was conducted using pre-designed Microsoft Excel spreadsheets developed for Helen Keller International based on the Draft NPM. Statistical analysis was conducted in Microsoft Excel. Descriptive statistics were calculated and summarized using frequencies and proportions.

The Draft NPM only permits some compositional claims to be made on CPCF. For the purpose of this study, claims were assessed according to five claim categories (non-permitted compositional claims, nutrient content claims, nutrient function claims, disease risk reduction claims, other claims) in order to establish the specific types of claims made by CPCF in Senegal. Addendum 1 provides detailed definitions and examples of the claims assessed in this study.

Overall Draft NPM Outcome

A product was determined to be suitable for promotion for older infants and young children if it passed both the nutrient composition and labelling practices assessments. For each product, a final classification was made for this overall nutrient profiling outcome.

Laboratory Versus Label Nutrient Values

To determine the reliability of the label nutrition information, comparison was made between the laboratory measured values and the declared label value for the sub-sample of CPCF sent for laboratory analysis. Statistical analysis was conducted in Stata 17. Descriptive statistics were calculated and summarized using proportions. Medians with IQR were reported given the small sample size and nonnormally distributed data.

4. RESULTS - PRODUCT CHARACTERISTICS (n=348)

A total of 379 CPCF products that met the definition of a CPCF (Box 1) were purchased. Twenty-four products were excluded because they were duplicate products¹⁰ or provided incomplete/unclear label information (Figure 1). Seven products, all of which were bottled water, did not fit within the Draft NPM product categories, and were also excluded from the study. A final count of 348 products were included in the study, of which 329 were assessed against the Draft NPM. The remaining 19 products were juices/other drinks that automatically failed the Draft NPM and were counted together with the assessed products to determine the overall Draft NPM outcomes (Figure 1).

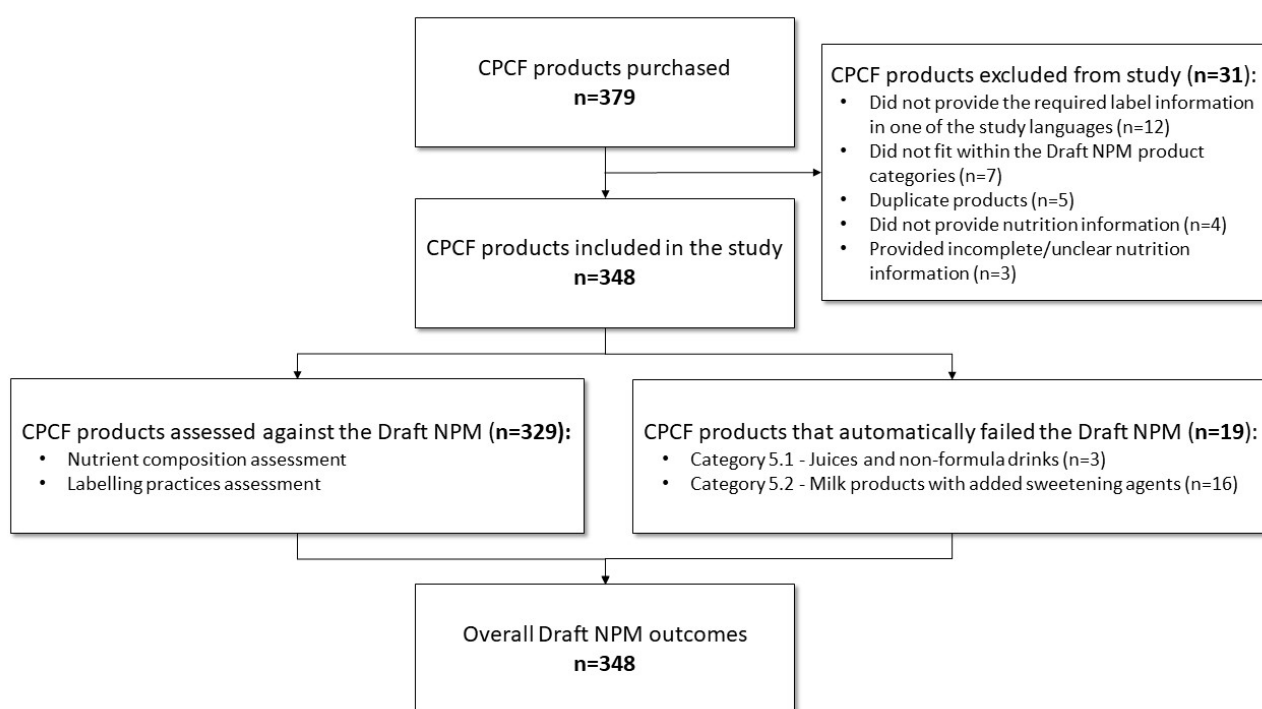


Figure 1: Flowchart of products purchased, included/excluded and assessed as part of the study

Among the final 348 products included, almost all products were imported (92.5%, n=322) and only 7.5% (n=26) locally manufactured, representing a total of 32 manufacturers (25 international, 7 national) (Table 3). Twenty-five brands were represented, with the most common brands, Blédina and Nestlé, accounting for more than half of all products (56.0%; n=195) (Table 3). The majority of products were manufactured in Europe (81.6%, n=284), with the remaining products manufactured in Africa (12.6%, n=44), South America (5.5%, n=19) and the Middle East (0.3%, n=1) (Table 3).

¹⁰ Products where two units of the same product were purchased. As only one of each unique CPCF product should have been purchased, the second unit was excluded from the data set.

Table 3: Brands and manufacturers of CPCF sold in Guédiawaye and Dakar Departments, Senegal (n=348)

Brand	Manufacturer	Country of manufacture	No. of products by manufacturer	% (n) of products by brand
Blédina	Blédina SAS/ Blédina SAS (Danone)/ Blédina SAS (for Danone Nutricia A&O)	France	140	40.2 (140)
Nestlé	Nestlé France	France	50	15.8 (55)
	Nestlé Egypt S.A.E.	Egypt	3	
	Nestlé Ghana Limited	Ghana	2	
Pommette	Babynov (Intermarche)	France	12	6.3 (22)
	SARL Dorcer (Intermarche)		4	
	Cook Inov (Intermarche)		4	
	Société Nouvelle Yabon Verneuil (Intermarche)		2	
Tout Petits	Coopérative U Enseigne	France	21	6.0 (21)
HiPP Biologique	HiPP France	France	18	5.2 (18)
Le Lionceau	Le Lionceau SARL	Senegal	17	4.9 (17)
Babybio	Vitagermine	France	16	4.6 (16)
Babypot	Intelma SARL Kml BCCD	Morocco	7	2.0 (7)
Nutribom	Nutritional S.A. IND. E COM. De Alimentos	Brazil	6	1.7 (6)
Cow & Gate	Nutricia Ltd (Cow & Gate)	Ireland	3	1.7 (6)
	Cow & Gate		3	
Vita Meal	Agro-Food Industrie	Morocco	6	1.7 (6)
Babybom	AIA S/A CNPJ	Brazil	5	1.4 (5)
Babylac	AIA - LTDA	Brazil	4	1.1 (4)
Nutrilac	Nutritional S.A. IND. E COM. De Alimentos	Brazil	4	1.1 (4)
Be Plus	Vicky Foods Products, S.L.U.	Spain	4	1.1 (4)
My Baby	Interdis	France	4	1.1 (4)
Suukabe Baby Food	Suukabe SARL	Senegal	3	0.9 (3)
Saafilac	Agro Saafi	Senegal	2	0.6 (2)
Melolac	Senfoods SA	Senegal	1	0.6 (2)
	Hassani Baby Food and Milk Powder Production Factory	United Arab Emirates	1	
Les Tilapins de Casino	Casino	France	1	0.3 (1)
Ignafaan	Senbioagro Corporation	Senegal	1	0.3 (1)
Cigal	Cigal	Senegal	1	0.3 (1)
Goodgout	Goodgout	France	1	0.3 (1)
Forza	Molinos el Guancho	Spain	1	0.3 (1)
Vitaruy	Galisen	Senegal	1	0.3 (1)
		Imported products	322	92.5
		Locally manufactured products	26	7.5
		Grand total	348	100.0

Table 4 shows the characteristics of the CPCF products sold in Senegal. All products were included as CPCF in this study due to their provision of a recommended age of use of less than 3 years on the product label. Almost all products (98.3%, n=342) presented label information in Senegal's official language, French, alone or in combination with English/other languages. No products provided label information in Wolof. Over three-quarters (78.2%, n=272) of products were ready-to-eat or heat foods/beverages, while the remaining products required adding (or cooking in) liquid.

Table 4: Characteristics of CPCF sold in Guédiawaye and Dakar Departments, Senegal (n=348)

CHARACTERISTIC	% (n)
Recommended age of use	
4-36 months	0.6 (2)
4 months and above	16.4 (57)
6-36 months	6.9 (24)
6 months and above	44.3 (154)
7 months and above	1.4 (5)
8-36 months	0.9 (3)
8 months and above	7.2 (25)
9 months and above	0.3 (1)
10 months and above	2.9 (10)
12 months and above	11.8 (41)
15 months and above	3.7 (13)
18 months and above	3.2 (11)
24 months and above	0.6 (2)
Label language	
French only	77.9 (271)
French with English/ other language combination	20.4 (71)
English only	1.7 (6)
Preparation type	
Ready-to-eat	40.8 (142)
Heat	37.4 (130)
Instant – add water	9.8 (34)
Instant – add milk	8.0 (28)
Cook – add water	2.3 (8)
Instant – add milk or water	1.7 (6)

5. RESULTS: NUTRIENT COMPOSITION ASSESSMENT (n=329)

The predominant product category was category 2 ‘soft-wet spoonable, ready-to-eat foods’ (hereafter referred to as purees), while ‘snacks/finger foods’ (category 4) was the smallest category (Table 5).

Of the 329 CPCF assessed by the Draft NPM, 56 (17.0%) passed the nutrient composition assessment (fell within all relevant thresholds) (Table 5). This included 9.2% (n=7) of the dry/instant cereals/starches (category 1), 21.7% (n=42) of the purees, 14.3% (n=7) of the chunky meals (category 3), and no snacks/finger foods.

Across all product categories, the products performed best against the Draft NPM fat threshold with 98.5% (n=324) falling within the threshold. Of the Draft NPM thresholds that applied to all products, products performed worst against the no added sugar/sweetener requirement with 65.7% (n=216) meeting this requirement (Table 5).

5.1 DRY/INSTANT CEREALS/STARCHES (Category 1.1)

Less than ten percent (n=7) of the dry/instant cereal/starch products fell within all the relevant nutrient composition thresholds (Table 5). Only 11.8% (n=9) of dry/instant cereals/starches met the Draft NPM requirement of no added sugar/sweeteners. One third of dry/instant cereals/starches were flagged for high sugar content warnings (32.6%, n=14). Compared to other product categories, dry/instant cereals/starches had the highest median total sugar content of 25.1g per 100g of product (Table 6).

When assessed against the other four nutrient composition thresholds applicable to dry/instant cereals/starches, this category of products generally performed well. Nearly all dry/instant cereals/starches (98.7%, n=75) were within the Draft NPM fat threshold and the Draft NPM protein threshold, and 89.5% (n=68) of dry/instant cereals/starches met the added fruit content limit. Eighty-eight percent (n=67) were within the Draft NPM sodium threshold (Table 5).

5.2 PUREES (Categories 2.1 / 2.2 / 2.3 / 2.4 / 2.5 / 2.6 / 2.7)

Nearly all purees met the Draft NPM requirement of no added sugar/sweeteners, with the exception of dairy-based purees, of which only 6.7% (n=2) were free from added sugar/sweeteners. Total sugar content varied across subcategories of purees. Compared to other subcategories of purees, fruit purees and dairy-based purees had highest median sugar content—10.0g and 8.4g per 100g of product, respectively (Table 6).

Among subcategories of purees with applicable protein and total fat thresholds, nearly all products were within these thresholds. Across all subcategories of purees, median fat content ranged between 0.2 to 3.1g per 100g of product (Table 6).

Nearly all subcategories of purees met the added fruit content limit. Dairy-based purees slightly underperformed against this threshold, with three-quarters (n=23) meeting the added fruit content limit (Table 5).

Performance against the Draft NPM sodium threshold and energy density threshold varied across the subcategories of purees. Nearly all fruit purees were within the sodium threshold (97.5%, n=78), while only one-third of pureed meals with cheese and pureed meals with meat/fish were within the maximum sodium limit (Table 5). Less than a quarter of fruit purees were within the Draft NPM energy density threshold (Table 5).

5.3 CHUNKY MEALS (Categories 3.1 / 3.2)

Chunky meals performed well against the added sugar/sweetener requirement, the added fruit threshold, and the total fat threshold (Table 5). However, over one-third (36.0%) of the vegetable meals had total sugar content that would warrant a front-of-pack high sugar warning label (Table 6).

Less than a quarter of meals in both the meat/fish/cheese subcategory and the vegetable subcategory were within the maximum sodium limit (Table 5). The median sodium content for meat/fish/cheese meals and the vegetable meals was very high— 99 and 97mg per 100g of product, respectively (Table 6).

Less than two-thirds of vegetable meals (60.0%) fell within the protein threshold while only 8.3% of the meat/fish/cheese meals were within the protein threshold (Table 5).

5.4 SNACKS/FINGER FOODS (Category 4.3)

None of the snacks/finger foods were within all the relevant nutrient composition thresholds of the Draft NPM. All snacks/finger foods failed to meet the added sugar/sweetener requirement. According to the Draft NPM, snacks/finger foods with greater than 15.0% energy from total sugars are not nutritionally suitable for older infants and young children. Less than one-third (30.0%) of snacks/finger foods were within this threshold (Table 5). Median sugar content for snacks/finger foods was high—17.3 g per 100g of product (Table 6).

Half of all snacks/finger foods met the maximum sodium limit (Table 5).

Only 60.0% of snacks/finger foods were within the total fat threshold (Table 5). Compared to other product categories, snacks/finger foods had the highest median fat content of 13.6g per 100g of product.

5.5 NUTRIENT COMPOSITION ASSESSMENT BY REGION OF MANUFACTURE

Upon further analysis of the nutrient composition assessment results by region of manufacture, 18.9% (n=50 of 265) of CPCF manufactured in Europe (France, Ireland, Spain) and 13.6% (n=6 of 44) of products manufactured in Africa (Senegal, Morocco, Egypt, Ghana) fell within all relevant nutrient composition thresholds. None of the products manufactured in South America (Brazil, n=19) and the Middle East (United Arab Emirates, n=1) passed the nutrient composition assessment.

Just over three-quarters (75.9%, n=201) of European-manufactured CPCF and one-third (34.1%, n=15) of African-manufactured CPCF met the Draft NPM requirement of no added sugar/sweetener, while none of the products manufactured in South America and the Middle East met this requirement.

Seventy-one percent (n=189) of European-manufactured CPCF, 77.3% (n=34) of African-manufactured CPCF, 79.0% (n=15) of South American-manufactured CPCF and the one Middle East-manufactured product fell within the sodium threshold.

Table 5: Proportion of products that passed the Draft NPM nutrient composition assessment of commercially produced complementary foods (n=329)¹

Product category	n	Within all relevant nutrient composition thresholds	No added sugar/sweetener ²	Low/no added fruit ³	Less than 15% energy from sugar ⁴	Within the sodium threshold ⁵	Within the energy density threshold ⁶	Within the protein threshold ⁷	Within the total fat threshold ⁸
1.1 Dry or instant cereals/starches	76	9.2 (7)	11.8 (9)	89.5 (68)	NA	88.2 (67)	NA	98.7 (75)	98.7 (75)
2.1 Dairy-based desserts and cereal products	30	0.0 (0)	6.7 (2)	76.7 (23)	NA	86.7 (26)	100.0 (30)	96.7 (29)	100.0 (30)
2.2 Fruit purée	80	21.3 (17)	90.0 (72)	NA	NA	97.5 (78)	23.8 (19)	NA	100.0 (80)
2.3 Vegetable only purée	30	16.7 (5)	100.0 (30)	100.0 (30)	NA	70.0 (21)	NA	NA	100.0 (30)
2.4 Vegetable purée with cereals	21	28.6 (6)	100.0 (21)	95.2 (20)	NA	61.9 (13)	57.1 (12)	NA	100.0 (21)
2.5 Puréed meal with cheese	3	66.7 (2)	100.0 (3)	100.0 (3)	NA	33.3 (1)	100.0 (3)	100.0 (3)	100.0 (3)
2.6 Puréed meal with meat/fish mentioned in product name	3	33.3 (1)	100.0 (3)	100.0 (3)	NA	33.3 (1)	33.3 (1)	100.0 (3)	100.0 (3)
2.7 Puréed meal with meat/fish not mentioned in product name	27	40.7 (11)	100.0 (27)	96.3 (26)	NA	63.0 (17)	44.4 (12)	100.0 (27)	100.0 (27)
3.1 Chunky meal with meat/fish/cheese	24	4.2 (1)	100.0 (24)	100.0 (24)	NA	16.7 (4)	NA	8.3 (2)	100.0 (24)
3.2 Chunky meal with vegetables	25	24.0 (6)	100.0 (25)	100.0 (25)	NA	24.0 (6)	NA	60.0 (15)	100.0 (25)
4.3 Snacks and finger foods	10	0.0 (0)	0.0 (0)	NA	30.0 (3)	50.0 (5)	NA	NA	60.0 (6)
All relevant products	329	17.0 (56)	65.7 (216)	92.9 (222)⁹	30.0 (3)¹⁰	72.6 (239)	47.0 (77)¹¹	81.9 (154)¹²	98.5 (324)

¹Values are presented as % (n); NA=not applicable based on category.

²The following were considered added sugar/sweetener: sugar, juice (except lemon/lime), sucrose, dextrose, fructose, glucose, maltose, galactose, trehalose, syrup, nectar, honey, malted barley, malt extract, molasses.

³Requirement definition per applicable category – 1.1: <10% by weight dried/powdered fruit; 2.1/2.5/2.6/2.7/2.8/3.1/3.2: ≤ 5% by weight fruit purée; 2.3/2.4: no added fruit/ fruit purée.

⁴Applicable to category 4.3 only.

⁵Requirement definition per applicable category – 1.1: sodium <50mg/100kcal; 2.1/2.2/2.3/2.4/4.3: sodium < 50 mg/100 kcal and <50mg/100g; 2.5: sodium < 100 mg/100 kcal and 100mg/100g; 2.6/2.7/2.8/3.1/3.2: sodium < 50 mg/100 kcal and <50mg/100g (or < 100 mg/100 kcal and <100mg/100g if cheese is listed in front- of-pack name).

⁶Requirement definition per applicable category – 2.1/2.2/2.4/2.5/2.6/2.7: energy density ≥ 60 kcal/100g.

⁷Requirement definition per applicable category – 1.1: < 5.5 g/100 kcal total protein; 2.1/2.5/: ≥ 2.2 g dairy protein/100kcal; 2.6: total protein ≥ 4 g/100 kcal from the named source and protein named as the first food(s) in the product name must be ≥ 10% by weight of the total product; 2.7: total protein ≥ 3g/100 kcal and protein source mentioned in the product name must be ≥ 8% by weight of the total

product; 2.8: ≥ 7 g/100 kcal total protein; 3.1: total protein ≥ 4 g/100kcal and protein source mentioned in the product name must be $\geq 10\%$ by weight of the total product; 3.2: ≥ 3 g/100 kcal total protein.

⁸Requirement definition per applicable category – 1.1/2.1/2.2/2.3/2.4/2.7/3.2/4.3: ≤ 4.5 g/ 100 kcals total fat; 2.5/2.6/2.8/3.1: ≤ 6 g/100 kcal total fat.

⁹Denominator is 239 products as threshold is not relevant for 90 products.

¹⁰Denominator is 10 products as threshold is not relevant for 319 products.

¹¹Denominator is 164 products as threshold is not relevant for 165 products.

¹²Denominator is 188 products as threshold is not relevant for 141 products.

Table 6: Sugar warning and nutrient content of commercially produced complementary food products with relevant nutrient declarations (n=329)¹

Product category	n ²	Requires 'high sugar' warning ³	n ²	Total sugar per 100g (g)	n ²	Sodium per 100g (mg)	n ²	Protein per 100g (g)	n ²	Total fat per 100g (g)
1.1 Dry or instant cereals/starches	43	32.6 (14)	43	25.1 [17.3-32.7]	73	76 [17-130]	75	11.0 [9.0-14.0]	76	3.2 [1.4-7.8]
2.1 Dairy-based desserts and cereal products	30	16.7 (5)	30	8.4 [7.6-9.2]	30	40 [30-40]	30	2.9 [2.6-3.2]	30	3.1 [2.7-3.2]
2.2 Fruit purée	77	100.0 (77)	77	10.0 [9.0-11.0]	79	3 [3-5]	80	0.5 [0.4-0.5]	80	0.2 [0.1-0.5]
2.3 Vegetable only purée	29	24.1 (7)	29	2.1 [0.9-3.1]	30	19 [10-28]	30	1.1 [0.8-1.6]	30	0.5 [0.2-1.1]
2.4 Vegetable purée with cereals	21	38.1 (8)	21	2.2 [1.8-3.4]	21	20 [13-31]	21	2.0 [1.3-2.4]	21	1.7 [1.1-1.9]
2.5 Puréed meal with cheese	3	0.0 (0)	3	1.5 [1.0-1.6]	3	80 [30-80]	3	3.3 [3.2-4.5]	3	2.7 [2.4-2.8]
2.6 Puréed meal with meat/fish mentioned in product name	1	0.0 (0)	1	0.5 [--]	1	32 [--]	3	3.4 [3.3-3.5]	3	1.3 [1.0-1.4]
2.7 Puréed meal with meat/fish not mentioned in product name	26	30.8 (8)	26	1.9 [1.6-2.3]	26	26 [20-30]	27	2.7 [2.3-2.9]	27	1.9 [1.6-2.0]
3.1 Chunky meal with meat/fish/cheese	24	12.5 (3)	24	1.4 [1.1-1.7]	24	99 [94-110]	24	2.8 [2.5-3.0]	24	2.2 [2.0-2.6]
3.2 Chunky meal with vegetables	25	36.0 (9)	25	1.8 [1.3-2.8]	25	97 [60-99]	25	2.3 [1.6-2.7]	25	2.0 [1.8-2.7]
4.3 Snacks and finger foods	10	NA	10	17.3 [16.0-25.5]	10	50 [40-124]	10	6.4 [6.1-8.5]	10	13.6 [12.0-23.2]

¹Values are presented as % (n) and median [interquartile range].

²Products without relevant nutrient content declarations on label are excluded.

³Front-of-pack 'high sugar' warning required if the percentage energy from total sugar content is \geq the threshold for that product category – 1.1: 40%; 2.1/2.2/2.3: 30%; 2.4: 20%; 2.5/2.6/2.7/3.1/3.2.

6. RESULTS: LABELLING PRACTICES ASSESSMENT (n=329)

Of the 329 products assessed, none passed all the relevant Draft NPM labelling requirements (see Table 7 for all results presented in this section).

6.1 PROTECTION AND PROMOTION OF BREASTFEEDING

All products (n=329) were assessed against five labelling requirements related to the protection and promotion of breastfeeding. Products generally performed relatively well against three of the requirements. None of the products were found to suggest superiority or equivalence to breastmilk. Products from all categories recommended a minimum age of introduction of at least six months, with the exception of purees, where just under a third (30.4%, n=59) failed to meet this requirement, providing an age recommendation from 4 months (Table 4). While no purees or chunky meals recommended or promoted bottle feeding, this practice was found among nearly one-quarter (22.4%, n=17) of dry/instant cereals/starches and 20.0% (n=2) of snacks/finger foods.

Few products (11.6%, n=38) included a complete message on the importance of continued breastfeeding for up to two years or beyond, the majority of which (71.1%, n=27) were dry/instant cereal/starch products with 35.5% of products in this category providing the required message. Over half (56.5%, n=186) of all product labels used images or text that suggested suitability for infants under 6 months of age, a practice most commonly encountered in the snack/finger food category (70.0%, n=7) and dry/instant cereal/starch category (69.7%, n=53).

Dry/instant cereal/starch products demonstrated the highest compliance across all five protection and promotion of breastfeeding labelling requirements. While chunky meals (category 3) and snacks/finger foods had the greatest compliance for four out of the five requirements, both failed this section of the assessment as none of the products provided the required continued breastfeeding message.

6.2 CLAIMS

With the exception of one puree from the Be Plus brand, which made no claims, all products failed to meet the claims requirement of the Draft NPM by making at least one claim.

Almost all CPCF labels made 'other' claims (87.8%, n=289), which included general health claims and marketing claims related to texture, taste, quality and convenience, and non-permitted compositional claims (82.4%, n=271). None of the products made disease risk reduction claims. Snack/finger foods made non-permitted compositional claims and 'other' claims only, whereas all other categories made nutrient content and nutrient function claims, in addition to non-permitted compositional and 'other' claims.

Of the five product categories, dry/instant cereals/starches most commonly made nutrient content and nutrient function claims (85.5%, n=65 and 60.5%, n=46 respectively).

6.3 PRODUCT NAME AND INGREDIENT LIST CLARITY

Across all product categories, most front-of-pack product names/descriptions reflected the ingredients in descending order as provided in the ingredient list.

For products required to declare the percentage of protein or fruit in the ingredient list, the majority (98.1% [n=53] and 81.5% [n=97] respectively) of products complied with this requirement. However, none of the products required to declare the percentage of added water in the ingredient list complied with the requirement.

Most snacks/finger foods (87.5%, n=7) complied with all relevant requirements for product name and ingredient list clarity, while this was achieved by only 8.2% (n=4) of chunky meals – the worst performing category in the 'Product name and ingredient list clarity' section.

6.4 MESSAGES ON PRODUCTS WITH A SPOUT

Some purees are packaged in a pouch with a spout that has a cap. The Draft NPM requires that these products include two messages on the label to ensure the safe and appropriate use of the product. Of the three puree products with a spout included in the study, all carried a warning that the cap was a choking hazard, but only two products stated that the product should not be consumed directly from the spout.

6.5 AGE RESTRICTION ON PUREED PRODUCTS

Pureed products are required to indicate a maximum recommended age of use of 12 months. While 9.8% (n=19) of product labels provided an upper age limit of 36 months, most products provided no maximum age restriction, and none complied by providing an age limit of 12 months.

Table 7: Proportion of products that passed the Draft NPM labelling practices assessment of commercially produced complementary foods (n=329)¹

Labelling requirements	n ²	All products	Product category			
			1. Dry or instant cereals/starches (n=76)	2. Soft-wet spoonable, ready-to-eat foods (n=194)	3. Meals with chunky pieces (n=49)	4. Dry finger foods and snacks (n=10)
Protection and promotion of breastfeeding						
Has a minimum recommended age of introduction of at least 6 months	329	82.1 (270)	100.0 (76)	69.6 (135)	100.0 (49)	100.0 (10)
Not marketed as suitable for <6m	329	43.5 (143)	69.7 (53)	26.8 (52)	63.3 (31)	70.0 (7)
Message on importance of breastfeeding ≥2y	329	11.6 (38)	35.5 (27)	5.7 (11)	0.0 (0)	0.0 (0)
Does not suggest superiority or equivalence to breastmilk	329	100.0 (329)	100.0 (76)	100.0 (194)	100.0 (49)	100.0 (10)
Does not recommend or promote bottle feeding	329	94.2 (310)	77.6 (59)	100.0 (194)	100.0 (49)	80.0 (8)
Subtotal	329	11.6 (38)	35.5 (27)	5.7 (11)	0.0 (0)	0.0 (0)
Claims						
No non-permitted compositional claims	329	17.6 (58)	50.0 (38)	9.3 (18)	2.0 (1)	10.0 (1)
No nutrient content claims	329	61.7 (203)	14.5 (11)	71.6 (139)	87.8 (43)	100.0 (10)
No nutrient function claims	329	79.0 (260)	39.5 (30)	90.2 (175)	91.8 (45)	100.0 (10)
No disease risk reduction claims	329	100.0 (329)	100.0 (76)	100.0 (194)	100.0 (49)	100.0 (10)
No other claims	329	12.2 (40)	13.2 (10)	12.9 (25)	10.2 (5)	0.0 (0)
Subtotal	329	0.3 (1)	0.0 (0)	0.5 (1)	0.0 (0)	0.0 (0)
Product name and ingredient list clarity						
Product name reflects ingredients in descending order as per ingredient list	269	88.1 (237)	79.4 (50)	92.1 (140)	84.8 (39)	100.0 (8)
Percentage of fruit stated in ingredient list ³	119	81.5 (97)	43.5 (10)	91.4 (85)	100.0 (1)	50.0 (1)
Percentage of added water stated in ingredient list ⁴	154	0.0 (0)	-	0.0 (0)	0.0 (0)	-
Percentage of protein stated in ingredient list ⁵	54	98.1 (53)	-	96.7 (29)	100 (24)	-
Subtotal	315⁶	41.9 (132)	64.6 (42)	40.9 (79)	8.2 (4)	87.5 (7)
Messages on products with a spout						
Product with spout states not to suck from the container? ⁷	3	66.7 (2)	-	66.7 (2)	-	-
Product with spout warns that cap is a choking hazard ⁷	3	100.0 (3)	-	100.0 (3)	-	-
Subtotal	3	66.7 (2)		67.0 (2)		
Age restriction on puréed products						
Maximum recommended age of use of 12 months? ⁸	194	0.0 (0)	-	0.0	-	-
Met all relevant labelling requirements	329	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)

¹Values are presented as % (n)²Number of product labels assessed against labelling requirement, excluding products where the requirement was not applicable.³All products excluding category 2.3 products (n=30) were assessed against this requirement, of which the requirement was applicable to 119 products.

⁴All products excluding category 1 (n=76) and category 4.3 (n=10) products were assessed against this requirement, of which the requirement was applicable to 154 products.

⁵Only categories 2.6-8 (n=30) and category 3.1 (n=24) products were assessed against this requirement.

⁶Excludes products (n=14) that were not assessed against one or more of the 'Product name and ingredient list clarity' requirements and the remaining requirements were not applicable.

⁷Only category 2 products (n=194) were assessed against this requirement, of which the requirement was only applicable to 3 products (those with spouts).

⁸Only category 2 products (n=194) were assessed against this requirement.

7. RESULTS: OVERALL NUTRIENT PROFILING OUTCOMES (n=348)

The Draft NPM proposes nutrient composition thresholds and labelling requirements that must both be complied with for CPCF to be considered suitable to be promoted for older infants and young children up to 36 months of age, in line with the WHA resolution 69.9.

Some products/product categories such as purees and chunky meals performed better than others against the nutrient composition thresholds, with just under a quarter (21.7%, n=42) of purees and 14.3% (n=7) of chunky meals complying with all the relevant thresholds (Table 5). However, none of the products/product categories passed all relevant labelling requirements (Table 7). In addition, 19 products (juices and other drinks) automatically failed the Draft NPM. As a result, all products included in the study (n=348) failed the Draft NPM and none were found to be suitable for promotion for older infants and young children (6-36 months) (Table 8).

Table 8: Nutrient composition and labelling practices assessment, combined Draft NPM outcome (n=348)¹

Product category	n	Complied with all the relevant nutrient composition thresholds and labelling requirements % (n)	
		Pass	Fail
1. Dry, powdered and instant cereal/starchy food.	76	0.0 (0)	100.0 (76)
1.1 Dry or instant cereals/starches	76	0.0 (0)	100.0 (76)
2. Soft-wet spoonable, ready-to-eat foods, typically smooth or semi-pureed packaged in jars or pouches and can be spoon-fed.	194	0.0 (0)	100.0 (194)
2.1 Dairy-based desserts and cereal products	30	0.0 (0)	100.0 (30)
2.2 Fruit puree with or without the addition of vegetables, cereals or milk	80	0.0 (0)	100.0 (80)
2.3 Vegetable only puree	30	0.0 (0)	100.0 (30)
2.4 Puréed vegetables and cereals	21	0.0 (0)	100.0 (21)
2.5 Puréed meal with cheese (not meat or fish) mentioned in the product name	3	0.0 (0)	100.0 (3)
2.6 Pureed meal with meat/fish mentioned as first food in product name	3	0.0 (0)	100.0 (3)
2.7 Puréed meal with meat or fish (not mentioned as first food in product name)	27	0.0 (0)	100.0 (27)
3. Meals with chunky pieces, often sold in trays or pots for older infants and young children.	49	0.0 (0)	100.0 (49)
3.1 Meat, fish or cheese-based meal with chunky pieces	24	0.0 (0)	100.0 (24)
3.2 Vegetable-based meal with chunky pieces	25	0.0 (0)	100.0 (25)
4. Dry finger foods and snacks	10	0.0 (0)	100.0 (10)
4.3 Other snacks and finger foods	10	0.0 (0)	100.0 (10)
5. Juices and other drinks	19	0.0 (0)	100 (19)
5.1 Single or missed fruit juices, vegetable juices, or other non-formula drinks	3	0.0 (0)	100 (3)
5.2 Cow's milk and milk alternatives, with added sugar or sweetening agent	16	0.0 (0)	100 (16)
Grand Total	348	0.0 (0)	100.0 (348)

¹ Values are presented as % (n).

8. RESULTS: LABORATORY VERSUS LABEL NUTRIENT VALUES

In total, 21 products were sent for laboratory analysis. Of these 21 products, 15 were imported and six were manufactured locally in Senegal. Results from this laboratory analysis and declared energy and nutrient contents for each product are detailed in Addendum 2. The proportion of declared nutrient contents measured by laboratory analysis for the 21 products is presented in Table 9a for internationally manufactured products and Table 9b for locally manufactured products. The nutrient variations as measured by laboratory analysis are detailed in Table 10 and Figure 1.

Twenty of the 21 products sent for laboratory analysis did not declare trans fatty acid content. One imported product declared trans fatty acid content of 0.00. However, while trace amounts of trans fatty acid were detected in 10 products, the other 11 had detectable amounts ranging from 0.01 to 0.43g per 100g of product (Addendum 2). None of the local products declared saturated fat, but all six were found to have detectable amounts ranging from 0.02 to 21.10g per 100g of product (Addendum 2). Four out of six local products did not declare total sugar, but total sugar as measured by laboratory for local products ranged from 0.70 to 35.30g per 100g of product (Addendum 2). Four out of six local products did not declare zinc, but zinc as measured by laboratory analysis for local products ranged from 0.17 to 6.8g per 100mg of product (Addendum 2). Of the seven products that did declare zinc (internationally manufactured and locally manufactured products), six products were found to have higher zinc content than declared on the label (Figure 1).

The greatest variation in laboratory measured value and declared label value was observed for sodium, with values ranging from 15% to 439% of the declared value. A large variation was also observed in iron, with values ranging from 28% to 159% of declared value (Table 10). Of the 10 products that declared iron, 6 products had a laboratory measured value higher than what was on the label (Figure 1). The smallest variation was observed for energy, with values ranging from 92% to 116% of the declared value (Table 10).

Table 9a: Proportion of declared nutrient contents below or above 100% the declared value on internationally manufactured products as measured by laboratory¹¹

Product name	AIA-LTDA Babylac - Infant cereals with milk Wheat and milk	Nestlé Egypt Nestlé Cerelac - Infant cereals with milk Wheat and Milk	Bledina SAS (Danone Nutricia A&O France) Bledina Bledine - Instant milk cereal flakes Fruit and milk	AIA/SAC NPJ Babyboom - Cereals Rice banana apple	Nutritional S.A. INDE COM. De Alimentos Nutribom - Infant cereals with milk Honey and wheat	Molinos el Gaucho Forza - Nutritional supplement for infants, children and athletes	Agro-Food Industrie Vita Meal Baby - Cereals Wheat milk cocoa	HiPP France HiPP Biologique Délices du Jardin - Organic vegetable purée Vegetable gardener	Blédina SAS, Danone Blédina - Fruit purée Fruit cocktail	Nestlé France Nestlé NaturNes - Vegetable purée Pumpkin	Vicky Food Products Be Plus - Fruit purée with Marie biscuit Fruit with biscuit	Interdis My Baby Bio - Organic mango and apple fruit purée Apple, mango	Blédina SAS Blédichef - Vegetable and fish-based meal Creamy spinach and Pacific salmon purée	HiPP France HiPP Biologique Les Menus Plaisirs - Complete organic meal Tomatoes pasta veal	Blédina SAS, Danone Blédina - My first petit beurre biscuit With chocolate chips
Energy kJ/100g	106%	98%	101%	112%	112%	108%	108%	114%	112%	98%	110%	95%	98%	96%	97%
Saturated fat g/100g	105%		104%		64%			89%	14%	82%			91%	70%	92%
Trans fatty acid g/100g															
Total fat g/100g	108%	94%	96%		115%	84%	110%	90%	26%	105%			90%	79%	90%
Total carbohydrate g/100g	105%	99%	105%	105%	115%	109%	113%	157%	117%	103%	109%	97%	117%	112%	100%
Total sugar g/100g			101%				166%	132%	117%	76%	97%	95%	125%	118%	89%
Protein g/100g	114%	108%	104%	156%	98%	112%	106%	119%	154%	105%	118%		88%	103%	116%
Calcium g/100g	102%	105%	97%	130%		92%	170%								
Iron g/100g	133%	146%	99%	159%	140%	93%	124%								
Sodium g/100g	114%	111%	99%	15%	128%		88%	169%		95%	98%		77%	96%	74%
Zinc g/100g		124%	125%		134%	96%	114%								

¹¹ Proportion was calculated as laboratory measured value divided by declared label value.

Colour Code	
Above 100% (laboratory measured value > declared label value)	
Below 100% (laboratory measured value < declared label value)	
100% (laboratory measured value = declared label value)	
Nutrient content not provided on the label	

Table 9b: Proportion of declared nutrient contents below or above 100% the declared value on nationally manufactured products as measured by laboratory¹²

	Cigal Cigal Vitaruy - Local cereals and legume based infat flour Multivitamin and milk	Agro Saafi Saafilac - Infant cereal with milk Multicereals	Senfoods SA Melolac - Baby cereals with milk	Le Lionceau SARL Le Lionceau Banana millet	Intelma SARL Babypot' Chicken tomato - rice	Le Lionceau SARL Millet - Cinnamon
Energy kJ/100g	105%	94%	102%	92%	102%	116%
Saturated fat g/100g						
Trans fatty acid g/100g						
Total fat g/100g	110%	54%	122%	42%	22%	112%
Total carbohydrate g/100g	110%	108%	131%	102%	121%	123%
Total sugar g/100g				100%		91%
Protein g/100g	61%	76%	121%	150%	102%	120%
Calcium g/100g		116%	124%			
Iron g/100g	28%	52%	132%			
Sodium g/100g		419%	83%			38%
Zinc g/100g		323%	139%			

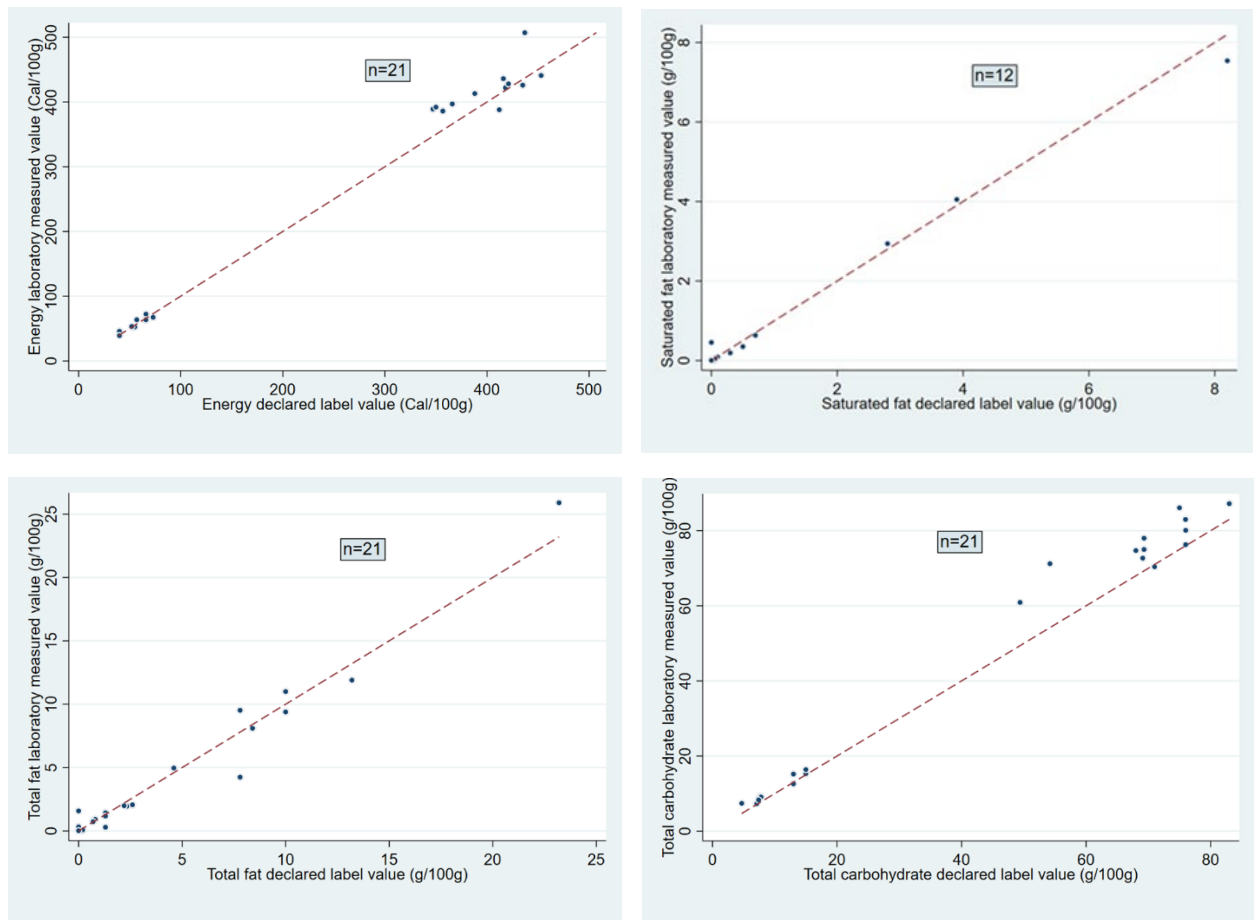
Colour Code	
Above 100% (laboratory measured value > declared label value)	
Below 100% (laboratory measured value < declared label value)	
100% (laboratory measured value = declared label value)	
Nutrient content not provided on the label	

¹² Proportion was calculated as laboratory measured value divided by declared label value.

Table 10: Descriptive statistics of proportion of declared nutrient content as measured by laboratory

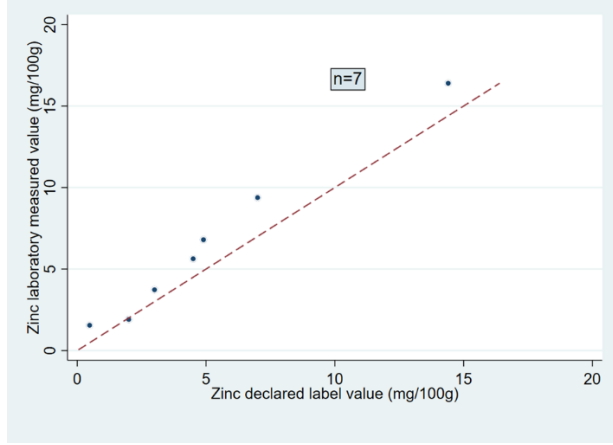
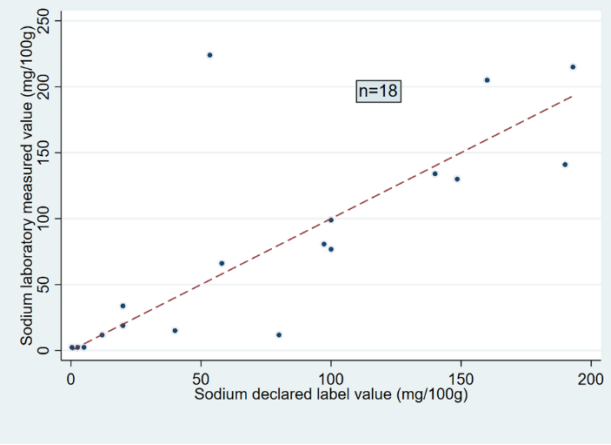
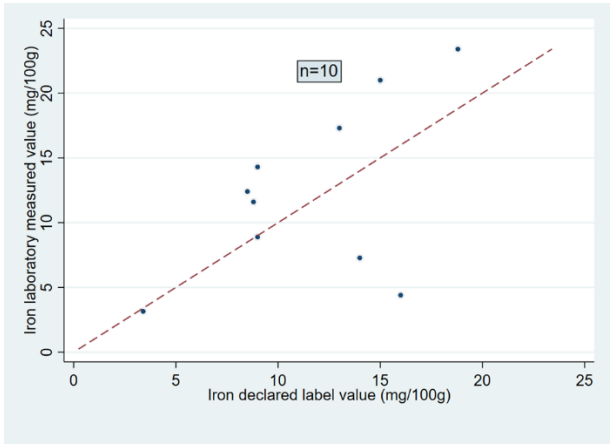
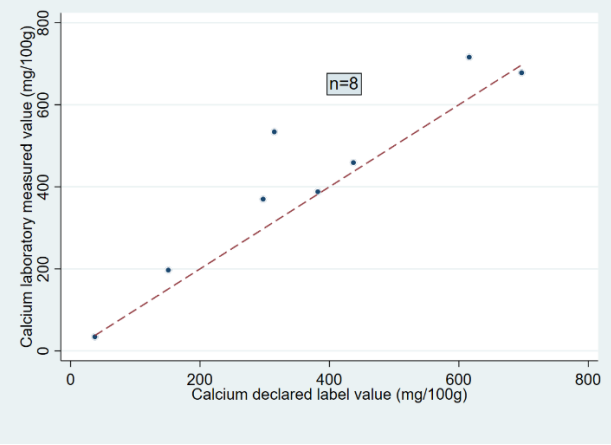
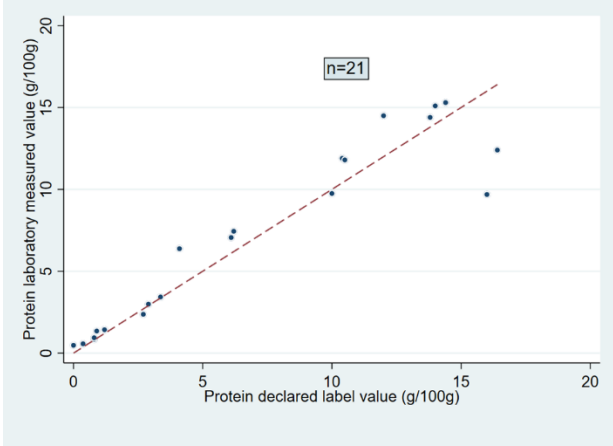
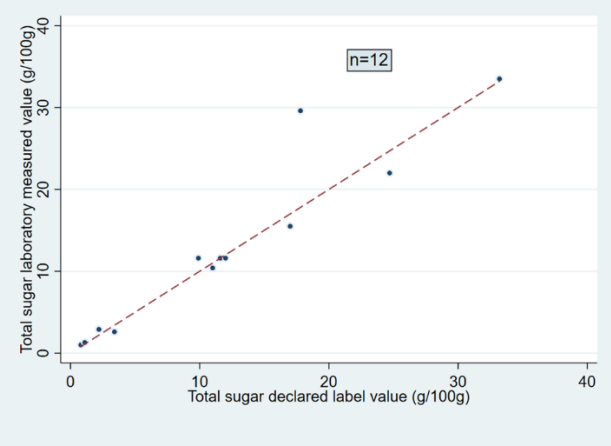
	Median (IQR)	Minimum	Maximum
Energy	102% (98-110%)	92%	116%
Saturated fat	89% (70-92%)	14%	105%
Total fat	92% (80-109%)	22%	122%
Total carbohydrate	109% (105-117%)	97%	157%
Total sugar	100% (94-120%)	76%	166%
Protein	110% (103-119%)	61%	156%
Calcium	111% (100-126%)	92%	170%
Iron	128% (94-138%)	28%	159%
Sodium	96% (80-113%)	15%	419%
Zinc	125% (119-136%)	96%	323%

Figure 1: Variation in laboratory measured values and declared label values for nutrients of interest^{13,14}



¹³ The dotted line represents equality (y=x).

¹⁴ Scatter plot was not generated for trans fatty acid laboratory measured value by trans fatty acid declared label value because 20 of the 21 products sent for laboratory measurement did not declare trans fatty acid content.



9. CONCLUSION

None of the CPCF sold in a peri-urban and urban setting in Senegal were found to be suitable for promotion, with only 17.0% (n=56) of the assessed products falling within the nutrient composition thresholds and none meeting the labelling requirements of the Draft NPM. Performance against the Draft NPM was poor for all CPCF, regardless of their region of manufacture. These findings confirm the importance of the WHO's call for countries to take all necessary measures, in the interest of public health, to end the inappropriate promotion of foods for older infants and young children. This includes the development and utilization of nutrient profile models to guide decisions on which foods are inappropriate for promotion (14,15) and to encourage reformulation of products to comply with composition thresholds and labelling requirements.

The Draft NPM was useful for providing a pass/fail result for each CPCF, and for clearly identifying problem areas in the nutrient composition and labelling of individual CPCF and CPCF categories. This information can greatly assist manufacturers in improving the formulation and labelling of CPCF. It is recommended that the Draft NPM be adopted, with additional adaptations¹⁵, for use in Senegal and more broadly in the West African region to ensure that CPCF available in these markets are suitable (both their composition and labelling) for older infants and young children.

Substantial political commitment and leadership, as well as strong, unambiguous, and enforced national legislation is required to ensure appropriate composition, safety, quality, nutrient levels, labelling and promotion of products specifically targeted at the vulnerable age group of 6-36 months of age. It is also likely that support from United Nations and non-governmental / civil society organisations will be necessary for establishing and implementing the NPM at the national and regional level.

All commitments and efforts to further control the promotion of these products will also have to withstand strong opposition from the private sector that continues to threaten the protection and promotion of optimal IYCF, in particular breastfeeding.

¹⁵ Information on the performance of the Draft NPM when applied in the Senegal context and recommended adaptations are available from Helen Keller International upon request.

10. REFERENCES

1. Schwarzenberg, S. J., Georgieff, M. K., & Committee on Nutrition. (2018). Advocacy for Improving Nutrition in the First 1000 Days to Support Childhood Development and Adult Health. *Pediatrics*, *141*(2), e20173716. <https://doi.org/10.1542/peds.2017-3716>
2. Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., Uauy, R., & Maternal and Child Nutrition Study Group (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet (London, England)*, *382*(9890), 427–451. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)
3. Haddad L, Zaidi S, Gazdar H. (2013) Investing in Nutrition: The foundation for development – an investment framework to reach the global nutrition targets. World Bank Group. Washington, DC. 2013; 1(1)
4. Bjelland, M., Brantsæter, A. L., Haugen, M., Meltzer, H. M., Nystad, W., & Andersen, L. F. (2013). Changes and tracking of fruit, vegetables and sugar-sweetened beverages intake from 18 months to 7 years in the Norwegian mother and child cohort study. *BMC Public Health*, *13*(1).
5. World Health Organization (WHO). (1981). International code of marketing of breast-milk substitutes. WHO. Retrieved from: https://www.who.int/nutrition/publications/code_english.pdf
6. World Health Assembly (WHA). (2002). WHA A55/15 Infant and young child nutrition, Global strategy on infant and young child feeding. Retrieved from: https://apps.who.int/gb/archive/pdf_files/WHA55/ea5515.pdf
7. PAHO (Pan American Health Organisation), & WHO (World Health Organization). (2003). *Guiding principles for complementary feeding of the breastfed child*. PAHO/WHO. https://iris.paho.org/bitstream/handle/10665.2/752/OP_194.pdf?sequence=1&isAllowed=y
8. Dewey, K. G., & Brown, K. H. (2003). Update on technical issues concerning complementary feeding of young children in developing countries and implications for intervention programs. *Food and Nutrition Bulletin*, *24*(1), 5–28. <https://doi.org/10.1177%2F156482650302400102>
9. Kimmons, J. E., Dewey, K. G., Haque, E., Chakraborty, J., Osendarp, S. J., & Brown, K. H. (2005). Low nutrient intakes among infants in rural Bangladesh are attributable to low intake and micronutrient density of complementary foods. *The Journal of nutrition*, *135*(3), 444–451. <https://doi.org/10.1093/jn/135.3.444>
10. Zinöcker, M. K., & Lindseth, I. A. (2018). The Western Diet-Microbiome-Host Interaction and Its Role in Metabolic Disease. *Nutrients*, *10*(3), 365. <https://doi.org/10.3390/nu10030365>
11. Chassaing B, Koren O, Goodrich J, Poole A et al. (2015). Dietary emulsifiers impact the mouse gut microbiota promoting colitis and metabolic syndrome. *Nature* *519* (7541):92-6. <https://doi.org/10.1038/nature14232>
12. World Health Organization (WHO). (2003). Global strategy for infant and young child feeding. WHO. Retrieved from: <http://apps.who.int/iris/bitstream/10665/42590/1/9241562218.pdf?ua=1&ua=1>
13. CFIA (Canadian Food Inspection Agency) (2011). Guide to food labelling and advertising.
14. World Health Organization (WHO). (2016). WHA 69 9/7 Add.1. Maternal, infant and young child nutrition, Guidance on ending the inappropriate promotion of foods for infants and young children, Report by the Secretariat. Retrieved from: https://apps.who.int/iris/bitstream/handle/10665/252656/A69_7Add1-en.pdf?sequence=1&isAllowed=y
15. World Health Organization (WHO) (2021, April 30). *Nutrient profiling*. <https://www.who.int/nutrition/topics/profiling/en/>
16. World Health Organisation (WHO). (2019). WHO Regional Office for Europe nutrient profile model. Retrieved from: https://www.euro.who.int/_data/assets/pdf_file/0005/270716/Nutrient-children_web-new.pdf
17. Agence Nationale de la Statistique et de la Démographie (ANSD) (2020). *Sénégal: Enquête Démographique et de Santé Continue (EDS-Continue) 2019*.

18. Sweet, L., Pereira, C., Ford, R., Feeley, A. B., Badham, J., Mengkheang, K., Adhikary, I., Sy Gueye, N. Y., Coly, A. N., Makafu, C., & Zehner, E. (2016). Assessment of corporate compliance with guidance and regulations on labels of commercially produced complementary foods sold in Cambodia, Nepal, Senegal and Tanzania. *Maternal & child nutrition*, 12 Suppl 2(Suppl 2), 106–125. <https://doi.org/10.1111/mcn.12268>
19. Feeley, A. B., Ndeye Coly, A., Sy Gueye, N. Y., Diop, E. I., Pries, A. M., Champeny, M., Zehner, E. R., & Huffman, S. L. (2016). Promotion and consumption of commercially produced foods among children: situation analysis in an urban setting in Senegal. *Maternal & child nutrition*, 12 Suppl 2(Suppl 2), 64–76. <https://doi.org/10.1111/mcn.12304>
20. Pereira, C., Ford, R., Feeley, A.B., Sweet, L., Badham, J., Zehner, E. (2016). Cross-sectional survey shows that follow-up formula and growing-up milks are labelled similarly to infant formula in four low and middle income countries. *Maternal & child nutrition*, 12 Suppl 2(Suppl 2), 91-105. <https://onlinelibrary.wiley.com/doi/full/10.1111/mcn.12269>

ADDENDA

Addendum 1: Types and definitions of claims assessed for as part of the Draft NPM assessment

Type of claim	Definition and examples
Non- permitted compositional claims	<p>Text stating/ implying that the composition of the product is different/ special, that that an ingredient has not been added to a food or that compares the nutrient levels and/ or energy value of the product to other products and/or brands.</p> <p>Example: “Natural ingredients”, “No added preservatives”</p>
Nutrient content claims ¹	<p>A nutrition claim that describes the level of a nutrient contained in a food.</p> <p>Example: “Source of calcium”, “9 Vitamins and Minerals”</p>
Nutrient function claims ¹	<p>A nutrition claim that describes the physiological role of the nutrient in growth, development and normal functions of the body.</p> <p>Example: “Nutrient A (naming a physiological role of nutrient A in the body in the maintenance of health and promotion of normal growth and development). Food X is a source of/ high in nutrient A.”</p>
Reduction of disease risk claims ¹	<p>Claims relating the consumption of a food or food constituent, in the context of the total diet, to the reduced risk of developing a disease or health-related condition.</p> <p>Risk reduction means significantly altering a major risk factor(s) for a disease or health-related condition. Diseases have multiple risk factors and altering one of these risk factors may or may not have a beneficial effect. The presentation of risk reduction claims must ensure, for example, by use of appropriate language and reference to other risk factors, that consumers do not interpret them as prevention claims.</p> <p>Example: “A healthful diet low in nutrient or substance A may reduce the risk of disease D. Food X is low in nutrient or substance A.”</p>
Other claims	<p>Includes all other claims made that are not related to compositional, nutrient content, nutrient function, or disease risk reduction. Includes marketing claims related to taste, quality and texture of the food, as well as convenience/lifestyle amongst others.</p> <p>Examples: “Easy to swallow texture.”, “Great for a busy and active lifestyle.”</p>

¹Definition based on Codex Alimentarius CAC/GL 23-1997

Addendum 2: Comparison of nutrient values per product: Declared label value (DV) and laboratory measured value (LV)

Internationally manufactured brands																
	AIA - LTDA Babylac - Infant cereals with milk Wheat and milk		Nestlé Egypt Nestlé Cerelac - Infant cereals with milk Wheat and Milk		Bledina SAS (Danone Nutricia A&O France) Bledina Bledine - Instant milk cereal flakes Fruit and milk		AIA/SACNPJ Babybom - Cereals Rice banana apple		Nutral S.A. IND E COM. De Alimentos Nutribom - Infant cereals with milk Honey and wheat		Molinos el Gaunche Forza - Nutritional supplement for infants, children and athletes		Agro-Food Industrie Vita Meal Baby - Cereals Wheat milk cocoa		HiPP France HiPP Biologique Délices du Jardin - Organic vegetable purée Vegetable gardener	
Nutrient	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV
Energy Cal/100g	388.00	413.00	435.00	426.00	418.00	422.00	347.00	389.00	350.00	392.00	366.00	397.00	356.70	386.00	40.00	45.70
Energy kJ/100g	1628.00	1727.99	1820.00	1782.38	1763.00	1765.65	1459.00	1627.58	1470.00	1640.13	1531.34	1661.05	1492.43	1615.02	168.00	191.21
Saturated fat g/100g	2.80	2.94	.	0.97	3.90	4.05	0.00	0.46	0.30	0.19	.	0.39	.	0.53	0.10	0.09
Trans fatty acid g/100g	0.00	0.22	.	0.03	.	<0.010	0.00	<0.010	0.00	<0.010	.	<0.010	.	0.01	.	<0.005
Total fat g/100g	4.60	4.96	10.00	9.39	8.40	8.10	0.00	1.58	0.80	0.92	2.33	1.95	1.30	1.43	1.30	1.17
Total carbohydrate g/100g	76.00	80.10	71.00	70.40	69.10	72.70	83.00	87.20	75.00	86.10	75.97	83.00	69.30	78.00	4.70	7.40
Total sugar g/100g	.	37.90	.	25.20	33.20	33.50	.	17.90	.	31.80	.	0.70	17.80	29.60	2.20	2.90
Protein g/100g	10.40	11.90	14.00	15.10	13.80	14.40	4.10	6.38	10.00	9.75	10.50	11.80	14.40	15.30	1.20	1.43
Calcium mg/100g	382.00	388.00	437.00	459.00	697.00	678.00	151.00	197.00	.	297.00	37.50	34.50	314.80	534.00	.	18.40
Iron mg/100g	13.00	17.30	8.50	12.40	9.00	8.89	9.00	14.30	15.00	21.00	3.40	3.15	18.80	23.40	.	0.34
Sodium mg/100g	58.00	66.10	193.00	215.00	100.00	98.90	80.00	11.80	160.00	205.00	.	74.80	148.50	130.00	20.00	33.80
Zinc mg/100g	.	1.14	3.00	3.73	4.50	5.63	.	7.35	7.00	9.38	2.00	1.91	14.40	16.40	.	0.20

Internationally manufactured brands, continued.														
	Blédina SAS, Danone Blédina - Fruit purée Fruit cocktail		Nestlé France Nestlé NaturNes - Vegetable purée Pumpkin		Vicky Food Products Be Plus - Fruit purée with Marie biscuit Fruit with biscuit		Interdis My Baby Bio - Organic mango and apple fruit purée Apple, mango		Blédina SAS Blédina Blédichef - Vegetable and fish-based meal Creamy spinach and Pacific salmon purée		HiPP France HiPP Biologique Les Menus Plaisirs - Complete organic meal Tomatoes pasta veal		Blédina SAS, Danone Blédina - My first petit beurre biscuit With chocolate chips	
Nutrient	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV
Energy Cal/100g	57.00	63.60	40.00	39.10	66.00	72.30	55.00	52.40	65.00	63.70	66.00	63.60	453.00	441.00
Energy kJ/100g	243.00	266.10	170.00	163.59	281.00	302.50	232.00	219.24	271.00	266.52	278.00	266.10	1906.00	1845.14
Saturated fat g/100g	0.05	0.01	0.06	0.05	0.00	0.03	Negligible	<0.005	0.70	0.63	0.50	0.35	8.20	7.54
Trans fatty acid g/100g	.	<0.005	.	<0.005	.	<0.005	.	<0.005	.	0.04	.	0.03	.	0.43
Total fat g/100g	0.19	0.05	0.70	0.73	0.00	0.32	Negligible	0.02	2.20	1.99	2.60	2.06	13.20	11.90
Total carbohydrate g/100g	13.00	15.20	7.10	7.30	15.00	16.40	13.00	12.60	7.80	9.10	7.40	8.30	76.00	76.30
Total sugar g/100g	9.90	11.60	3.40	2.60	12.00	11.60	11.00	10.40	0.80	1.00	1.10	1.30	24.70	22.00
Protein g/100g	0.37	0.57	0.80	0.84	0.80	0.94	Negligible	0.48	2.70	2.37	2.90	2.99	6.10	7.06
Calcium mg/100g	.	7.21	.	23.60	.	5.58	.	5.67	.	31.20	.	12.30	.	30.60
Iron mg/100g	.	<0.237	.	<0.238	.	<0.238	.	<0.243	.	0.42	.	0.32	.	1.25
Sodium mg/100g	2.50	<2.37	20.00	18.90	12.00	11.80	5.00	<2.43	100.00	76.80	140.00	134.00	190.00	141.00
Zinc mg/100g	.	<0.0474	.	0.13	.	<0.0477	.	<0.0487	.	0.25	.	0.39	.	0.48

Locally manufactured brands												
	Cigal Cigal Vitaruy - Local cereals and legume based infat flour Multivitamin and milk		Agro Saafi Saafilac - Infant cereal with milk Multicereals		Senfoods SA Melolac - Baby cereals with milk		Le Lionceau SARL Le Lionceau Banana millet		Intelma SARL Babypot' Chicken tomato - rice		Le Lionceau SARL Millet - Cinnamon	
Nutrient	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV	DV	LV
Energy Cal/100g	416.00	436.00	412.00	388.00	421.00	428.00	73.00	67.40	52.06	53.20	437.00	507.00
Energy kJ/100g	1740.	1824.22	1724.00	1623.39	1761.46	1790.75	305.43	282.00	218.00	222.59	1828.41	2121.29
Saturated fat g/100g	.	4.24	.	1.52	.	3.43	.	0.02	.	0.06	.	21.10
Trans fatty acid g/100g	.	0.05	.	0.01	.	0.06	.	<0.005	.	0.01	.	0.13
Total fat g/100g	10.00	11.00	7.80	4.24	7.80	9.52	0.20	0.08	1.30	0.29	23.20	25.90
Total carbohydrate g/100g	68.00	74.70	69.30	75.00	54.20	71.20	15.00	15.30	7.62	9.20	49.40	60.90
Total sugar g/100g	.	35.30	.	27.40	.	32.60	11.60	11.60	.	0.70	17.00	15.50
Protein g/100g	16.00	9.69	16.40	12.40	12.00	14.50	0.90	1.35	3.37	3.43	6.20	7.44
Calcium mg/100g	.	119.00	616.00	716.00	297.50	370.00	.	9.07	.	15.00	.	16.60
Iron mg/100g	16.00	4.40	14.00	7.28	8.80	11.60	.	0.44	.	0.54	.	1.48
Sodium mg/100g	.	229.00	53.40	224.00	97.30	80.70	0.40	<2.37	.	47.30	40.00	15.10
Zinc mg/100g	.	0.81	0.48	1.55	4.90	6.80	.	0.21	.	0.17	.	0.47

/ENDS