

Supplementary Appendix

Breastfeeding, first-food systems transformations and the global boom in commercial milk formula markets: A synthesis of data and literature on its dynamics, commercial determinants and consequences

Table S1. Commercial milk formula category definitions*

Category	Description and examples of leading brands
Total formula	Aggregate of standard, follow-up, toddler and special categories
- Standard formula	Commercial milk formula products marketed for infants aged 0–6 months, although some for 0–12 months. Major brands include Enfamil (Mead Johnson), Hohoemi (Meiji Dairies), Isomil (Abbott Laboratories), Nan (Nestlé), Similac (Abbott Laboratories), SMA (Pfizer), S-26 (Pfizer)
- Follow-up formula	Commercial milk formula products marketed for infants aged 6–12 months. Major brands include Beba (Nestlé), Carnation (Nestlé), Enfapro (Mead Johnson), Good Start (Nestlé), Nan (Nestlé), Promil (Pfizer), Step (Meiji Dairies), SMA (Pfizer)
- Toddler formula	Commercial milk formula products marketed for young children, typically aged 13–36 months (also called ‘growing-up milks’). Major brands include Bear Brand (Nestlé), Enfagrow (Mead Johnson), Lactel (Lactalis), Neslac (Nestlé), Nido (Nestlé), Similac Advance 3 (Abbott)
- Special formula	Commercial milk formulas for medical conditions, sold over-the-counter or by prescription. Includes products for: i) allergy treatment (e.g. Bayer Novalac Allergy, Mead Johnson Enfamil Pregestimil); ii) hypoallergenic - partially hydrolyzed to prevent cow's milk allergy (usually labelled 'HA' e.g. Nestle Nan HA1); iii) lactose intolerance - lactose free milks usually soy-based (e.g. Similac Isomil Advance Soy Formula), or processed to eliminate lactose content (e.g. Enfamil LactoFree LIPIL); and iv) others for specific conditions including premature birth (e.g. Enfamil Premature LIPIL), anti-diarrhoea (e.g. Bayer Novalac Diarrhoea), anti-regurgitation (e.g. Aptamil Gold+ AR), poor digestion (e.g. Enfamil Gentlease LIPIL), and reduced iron (e.g. Enfamil LIPIL Low Iron)

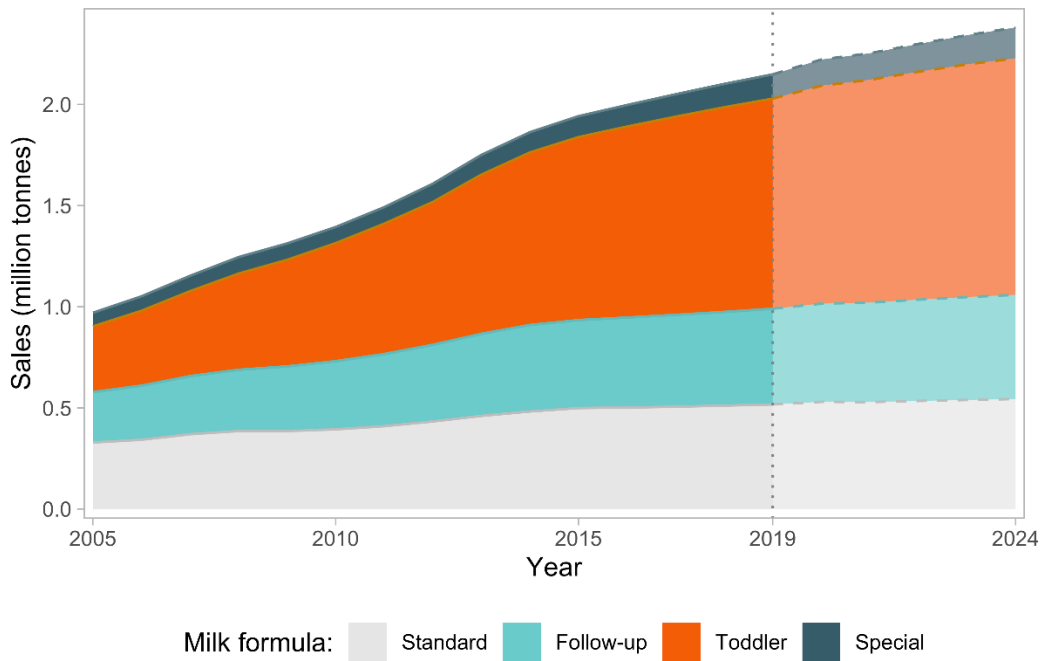
Footnotes: *These are categories defined by Euromonitor; in reality, a much wider range of age-specific categories exist. For example, RB Mead Johnson’s Enfamil brand includes products for newborns (0-3m), all infants (0-12m) and for a narrower toddler age band (9-18m). Many major brands are present across the standard, follow-up and toddler formula categories, reflecting the cross-promotion marketing strategy used by companies. Milk formula products also exist for children aged from 3-10 years, adolescents, pregnant and lactating mothers, and the elderly. Some products are not technically ‘milk’ formulas, as they contain no actual milk ingredients; for example, those containing non-milk protein sources.

Table S2. Included countries by World Bank income level and UNICEF region

Income level	GNI per capita US\$, PPP	Region	Country
High-income (N=37)	>\$12,376	East Asia and Pacific	Australia
		East Asia and Pacific	Hong Kong (China)
		East Asia and Pacific	Japan
		East Asia and Pacific	New Zealand
		East Asia and Pacific	Singapore
		East Asia and Pacific	South Korea
		Eastern Europe and Central Asia	Croatia
		Latin America and Caribbean	Chile
		Latin America and Caribbean	Uruguay
		Middle East and North Africa	Israel
		Middle East and North Africa	Saudi Arabia
		Middle East and North Africa	United Arab Emirates
		North America	Canada
		North America	USA
		Western Europe	Austria
		Western Europe	Belgium
		Western Europe	Czech Republic
		Western Europe	Denmark
		Western Europe	Estonia
		Western Europe	Finland
		Western Europe	France
		Western Europe	Germany
		Western Europe	Greece
		Western Europe	Ireland
		Western Europe	Italy
		Western Europe	Latvia
		Western Europe	Lithuania
		Western Europe	Netherlands
		Western Europe	Norway
		Western Europe	Poland
		Western Europe	Portugal
		Western Europe	Slovakia
		Western Europe	Slovenia
Western Europe	Spain		
Western Europe	Sweden		
Western Europe	Switzerland		
Western Europe	United Kingdom		
	\$3,996 – 12,375	East Asia and Pacific	China

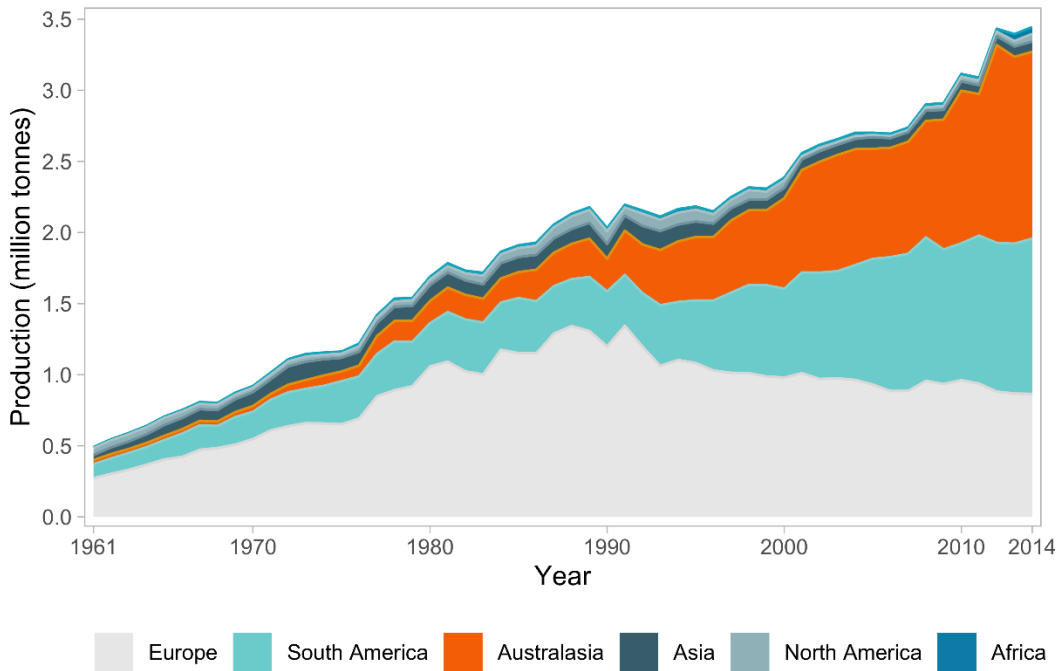
Income level	GNI per capita US\$, PPP	Region	Country
Upper-middle income (N=25)		East Asia and Pacific	Malaysia
		East Asia and Pacific	Thailand
		Eastern and Southern Africa	South Africa
		Eastern Europe and Central Asia	Azerbaijan
		Eastern Europe and Central Asia	Belarus
		Eastern Europe and Central Asia	Bosnia and Herzegovina
		Eastern Europe and Central Asia	Bulgaria
		Eastern Europe and Central Asia	Georgia
		Eastern Europe and Central Asia	Kazakhstan
		Eastern Europe and Central Asia	North Macedonia
		Eastern Europe and Central Asia	Romania
		Eastern Europe and Central Asia	Russia
		Eastern Europe and Central Asia	Serbia
		Eastern Europe and Central Asia	Turkey
		Latin America and Caribbean	Argentina
		Latin America and Caribbean	Brazil
		Latin America and Caribbean	Colombia
		Latin America and Caribbean	Costa Rica
		Latin America and Caribbean	Dominican Republic
		Latin America and Caribbean	Ecuador
		Latin America and Caribbean	Mexico
		Latin America and Caribbean	Peru
Middle East and North Africa	Algeria		
Western Europe	Hungary		
Lower-middle income (N=15)	\$1,026 – 3,995	East Asia and Pacific	Indonesia
		East Asia and Pacific	Philippines
		East Asia and Pacific	Vietnam
		Eastern and Southern Africa	Kenya
		Eastern Europe and Central Asia	Ukraine
		Eastern Europe and Central Asia	Uzbekistan
		Latin America and Caribbean	Bolivia
		Latin America and Caribbean	Guatemala
		Middle East and North Africa	Egypt
		Middle East and North Africa	Morocco
		Middle East and North Africa	Tunisia
		South Asia	India
		South Asia	Pakistan
		West and Central Africa	Cameroon
West and Central Africa	Nigeria		

Figure S1. Total commercial BMS sales volumes for all countries combined, 2005-19 with projections to 2024



Footnote: Data sourced from Euromonitor Passport

Figure S2. World dry milk production by region, 1961-2014



Footnote: Data sourced from the Food and Agricultural Organization (<http://www.fao.org/faostat>)