Submission - Proposal P1028 Infant Formula

2nd Call for Submissions – Proposal P1028
Infant Formula

Submission deadline: 7 July 2023
Submissions to be forwarded to: submissions@foodstandards.gov.au

Individual submission from:

FSANZ Proposal P1028
2nd Call for submissions document

- Section 2.3.4 **is NOT supported.** Lactose-free and low lactose infant formulae should not be available as general infant formulae. Lactose-free and low lactose formulae should be classified as SMPPi

SD2 Nutrient Composition

- Section 4.1 Carbohydrate Source **is NOT supported.** Lower limits for amount of carbohydrate and lactose (specifically) in infant formula must be included.

Overview:
Issue 1: Lactose-free infant formula should be classified as a Category 2 - SMPPi (Special Medical Purpose Product for Infants)

Issue 2: Minimum standards for concentrations of carbohydrate and lactose, specifically, in infant formula must be included (reference limit, lactose >53.6g/L). (Boss et al., 2018)

Issue 3: Infant formula that has had two of the three macronutrients extensively modified (extensively hydrolysed protein AND lactose-free) poses significant theoretical and unknown real risk to infants and urgently requires further investigation to ascertain safety.

Regulatory endorsement of infant formula that has been significantly altered from the biologic norm exposes the government, particularly when Proposal P1028 contains factual error in key definitions, regulations for carbohydrate limits are missing and there is no appropriate longitudinal data proving long-term safety. Classification of lactose-free infant formula as suitable for general use is misleading for caregivers and risks infant health. Availability of infant formula that is extensively hydrolysed AND lactose-free should be urgently reviewed.

Rationale:

1. Regulation of infant formula composition must be made from the perspective of how much it deviates from the biologic norm (i.e., human milk), as this is the benchmark for optimal health. Humans derive energy from 3 macronutrients: carbohydrate, protein, and fat. The major carbohydrate in human milk is lactose. (Hale & Hartmann, 2007) Proposal P1028 discusses carbohydrate (lactose) and protein almost interchangeably. The milk of each mammal is uniquely suited to its growth and developmental needs and the milk of one is not suitable to sustain the life of another. Human milk has the ***highest concentration of lactose of any mammalian milk*** (Table 1). (Hale & Hartmann, 2007) Lactose has multiple functions in addition to providing about 40% of the daily energy requirement. These functions include supporting innate immunity, gut microbiome, and the significant neurologic development (75% of brain growth) that occurs in our infants after birth. (Cederlund et al., 2013; Hale & Hartmann, 2007; Perella et al., 2021; Romero-Velarde et al., 2019; Slupsky et al., 2017) Evidence to prove risk is difficult to achieve as obtaining approval from human research ethics committees to conduct studies that require vulnerable participants to consume a diet so modified that compromised health can readily be hypothesised based on knowledge of normal biologic function is unlikely. Nevertheless, some evidence of risk is emerging. (Anderson et al., 2022) It should be noted that the availability of lactose-free infant formula for many years can not be taken as evidence of safety. Amino acid (elemental) formula had been available for nearly a quarter of a century before clinicians made the unexpected observation that it was associated with wide-spread hypophosphataemia and bone disease. (Gonzalez Ballesteros et al., 2017) Further, studies that prove evidence of weight gain and growth over some months do not adequately prove safety in terms of infant development. To detect impact on developmental parameters such as bone mineralisation, obesity and neurodevelopment requires longitudinal studies that follow infants into toddler and childhood. If these are not actively monitored, discovery of risk can take far longer, as evidenced by the journey to discovery of Fetal Alcohol Syndrome. (Armstrong, 1998)
2. **Proposal P1028 does not specify compositional requirements for carbohydrates and lactose in infant formula** (see table 7 p35). There are no specifications for minimum concentrations of carbohydrate (CHO) in infant formula, or carbohydrate type. The regulations do propose limits on the source of CHO, but only in relation to added sugar and fructose for formula manufactured from protein hydrolysates. The consequence is that **although lactose-free infant formula is significantly different to human milk in composition**, **it does not deviate from baseline nutritional composition for infant formula suitable for all healthy infants**. Because of this, there is no mechanism to classify these extensively modified products as SMPPi because the nutritional composition requirements aren't detailed enough to recognise the modification. This exposes the infant to risk and is not in line with best available scientific evidence on human milk composition. (Boss et al., 2018; Hale & Hartmann, 2007; Perella et al., 2021)
3. Page 15, Section 2.3.4 of Proposal P1028 is **factually incorrect**. This section discusses low lactose or lactose-free composition. The consequences of congenital lactose intolerance in the infant are significant. Further, lactose intolerance due to primary causes in the exclusively or predominantly milk-fed infant is very different to primary lactose intolerance in older children and adults. Lactose intolerance may be congenital, developmental, secondary, or primary: (Boss M & Hartmann P, 2018; Boss et al., 2020)
    a. *Congenital lactose intolerance*: A very rare autosomal recessive disorder that is characterised by the complete absence of the enzyme lactase with very poor prognosis. Infants with this disorder are extremely unwell from birth.
    b. *Developmental lactose intolerance:* Occurs in preterm babies of less than 34 weeks gestation and is a consequence of prematurity. Preterm infants should continue to receive breastmilk in all cases if available.

c. *Secondary lactose intolerance:* A condition secondary to any form of gastrointestinal mucosal injury. Breastfed infants should continue to receive breastmilk in all cases.
d. *Primary lactose intolerance:* The normal gradual reduction seen in lactase production during the progression to adulthood for about 70% of the world's population. Its presence depends on ethnicity, and is rare in populations with predominance of dairy foods in the diet (e.g. Northern Europeans). Reduced lactase production occurs from 2 years onwards and breastfed children should continue to receive breastmilk in all cases.

Consequences of secondary lactose intolerance (due to gut damage impacting on secretion of lactase from intestinal microvilli) vary depending on cause. A common cause of secondary lactose intolerance is viral gastrointestinal infection. This can cause short term symptoms, which resolve once the gut has healed. Usually lactose-free infant formula is not recommended for this condition. (Boss & Hartmann, 2019.)

4. Proposal P1028 incorrectly discusses cow's milk protein allergy as intolerance and, further, states that this is equivalent to lactose intolerance. These are two distinct and very different conditions. Cow's milk protein allergy involves the immune system and is characterised by the development of allergic symptoms after exposure to cow's milk protein. (ASCIA, 2019; Boss M & Hartmann P, 2018) It generally has a good prognosis, with most affected infants developing tolerance within about a year of diagnosis. (Boss & Hartmann, 2019) Lactose-free infant formula is not recommended for infants with cow's milk protein allergy who cannot be breastfed. (ASCIA, 2023) A true food intolerance does not involve the immune system. In the case of lactose intolerance, this is a syndrome involving a deficiency of the lactase enzyme (see discussion of lactose intolerance above).
5. Lactose-free infant formula is significantly modified from human milk composition and this can have a high cumulative impact across the life-span. (Munblit et al., 2020) When considered in the context of the best available scientific evidence on the physiological, metabolic, and biochemical processes that underline normal growth and development in infants**, lactose free infant formula is not suitable for general use** and should be classified as SMPPi.
6. **Availability of infant formula that contains both extensively hydrolysed protein AND is lactose-free should be urgently reviewed.** Humans are the only primates that wean before their infants can forage independently. The evolution of flexible transition to complementary foods helped balance the metabolic cost of lactation for mothers. However, this has allowed the modern, widespread introduction of physiologically inappropriate formulas that, while meeting some nutritional needs, are inadequate to meet the wider developmental and immunologic needs of the infant. (Sellen, 2007) Infant formula with extensively modified protein has been proven to be associated with risk and is appropriately being classified as SMPPi to limit general use. (Gonzalez Ballesteros et al., 2017) Lactose-free infant formula removes a carbohydrate that occurs in the highest concentrations of any mammalian milk and is required for a range of biologic processes discussed above. It can only be assumed that an infant formula that has had two of the three required macronutrients significantly modified - making it very different to human milk - is likely to be associated with risk. Use should be restricted until appropriate studies to understand the impact of these nutritional deficiencies into early childhood and beyond are available.

Table 1: Reproduced from Hale and Hartmann's Textbook of Human Lactation

Table 1. The Macro-Nutrient Content of Milk from Domestic, Laboratory and Aquatic Mammals Compared to Human Milk.

Milk Composition (g/L)			
Mammal	Lactose	Protein	Fat
Women	70	8	41
Horse	62	19	13
Pig	55	56	83
Cow	48	32	37
Goat	41	29	38
Sheep	48	55	74
Dog (she-wolf)	38	75	95
Rabbit	22	103	151
Harp Seal	1	87	422

In closing, two comments must be made. First, our understanding of the biologic nutritional norm is continuing to evolve and discoveries that have transformed our understanding of lactation physiology are the work of Australian experts who are globally recognised. (Geddes et al., 2021) As such, it is reasonable that Australia would lead the world in ensuring that regulations to protect infants who are receiving products that replace the biologic norm are updated to reflect latest scientific understanding of function. This supports health and minimises risk to our infants. Second, there is inequity in the consultation process for regulation review. Technical experts with appropriate understanding of lactation physiology (and the risks to infant health that occur with use of proprietary products that deviate from this) submit comment on a voluntary basis in their own time. They compete with an industry that has exponentially greater resources at their disposal to prepare submissions and have a vested interest in maintaining out-dated regulations that allow fewer restrictions on sale.

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