

Abstract Preview - Step 3/4

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Topic: NUTRITION - Breast milk and infant feeding

Title: **The palm oil free trend. Estimation of palmitic acid levels in infant formulas in four European countries**

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Text: **Objectives and Study:** Fats are an essential component of infant nutrition. Human milk (HM) is a rich source of lipids consisting of nearly 200 different fatty acids. The most dominant saturated fatty acid is palmitic acid (PA, C16:0), serving as a crucial energy source for newborns. To best resemble the fatty acid profile in HM, palm oil (PO) is commonly added to infant formulas as a relatively inexpensive source of PA, as no other vegetable oil contains relevant levels of this fatty acid. Alternatively, PA can be provided by enrichment with bovine milk lipids. The use of PO in infant formulas has raised public concerns due to erroneous beliefs that saturated fats should be avoided, as well as concerns on unsustainable production and potential presence of harmful contaminants. Despite the conclusions of ESPGHAN in May 2019 that there is insufficient evidence to suggest that PO should be avoided in infant formulas for health reasons, formulas without PO are now adopted by the markets based on consumer demand. The objective of this study was to assess the current market landscape in 4 EU countries regarding PA content and sources in infant formulas.

Methods: We analyzed online available information on current recipes of infant formulas and follow-on formulas on the market in Spain, Sweden, Czech Republic, and The Netherlands. Data was collected between November and December 2019, products were selected to have a cumulative market share of >80% in each country. To estimate the PA content of PO free (POF) formulas, we clustered fat blends used by manufacturers by combination of vegetable oils added. Subsequently, the fatty acid profile of a formula representative of a specific cluster was analyzed using Gas Chromatography with Flame Ionization Detector (GC-FID).

Results: In total 53 formulas by 7 brands were selected for analysis of which 57% were labeled as POF (Table 1). Five different clusters of vegetable oil blends were discerned; 3 for formulas with milk fat (PA content 18-21% of total fatty acids) and 2 for formulas without milk fat (PA content 6-8%). Of the POF formulas, 18 products were estimated to have PA levels lower than the minimum described in the literature in HM.

Country	n brands and cumulative market share	n products	% (n) POF formulas	% (n) POF formulas with PA content less than HM
Spain	5 (>90%)	18	89% (16)	44% (8)
Sweden	2 (>80%)	8	75% (6)	75% (6)
Czech Republic	4 (>90%)	15	40% (6)	27% (4)
The Netherlands	3 (>80%)	12	17% (2)	0% (0)
Total		53	57% (30)	34% (18)

[Table 1. Overview of analyzed formulas]

Conclusion: Our study shows that formulas without PO or milk fat will have a PA content of 6-8% compared to 17-25% in HM. Consequently, Spanish, Swedish, and Czech infants below 1 year will have a higher probability to be exposed to infant formulas with PA levels far away from HM, as compared to Dutch infants, where formulas have a similar PA level to HM. We argue that PO should not be avoided but replaced by either certified PO or, preferably, by bovine milk fat. Enrichment with milk fat will provide additional health benefits for infants, delivered by valuable lipids such as beta-palmitate and bioactive components from the milk fat globule membrane. It is unfortunate that public opinion, based on unproven scientific evidence, drive the development and marketing of infant formulas which move further away from the composition of the golden standard HM.

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