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Summary of the Intake Assessment of EPA/DHA Omega-3 Oils and Vegetable Oil using Food Consumption Data from the European Union (EU)

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Summary

The Global Organization for EPA and DHA Omega-3s (GOED) requested Exponent to undertake an intake assessment for vegetable oil and eicosapentaenoic acid (EPA)/docosahexaenoic acid (DHA) omega-3 oils using data from relevant populations in the European Union (EU). The purpose of this task is to provide a comparison of the intake of EPA/ DHA omega-3 oils in relation to vegetable oil intake in similar population groups¹. The detailed assessments for vegetable oil intake and EPA/DHA omega-3 oils intake were provided to GOED in two separate reports, and this is a short summary of the top-line methods and findings from those two reports.

For the assessment of vegetable oil intake in EU populations, nationally representative food consumption survey data on different population groups in the EU were used, derived from the European Food Safety Authority (EFSA) Comprehensive food consumption survey database ('Comprehensive Database'). Consumption data relevant for vegetable oil intake in this survey database were examined according to the EFSA FoodEx coding system and using the EFSA DietEx tool. Due to the lack of available data in the Comprehensive Database that could be directly used for the intake assessment of EPA/DHA omega-3 oils, a number of alternative sources of data sources were used, taking into consideration their use as ingredients (i.e. in food supplements, fortified foods, and in infant/follow-on formulae). Such alternative data sources included information on the volume of EPA/DHA omega-3 oils used in the food supply in the EU, along with information on the levels of EPA/DHA omega-3 oils in food supplements and in fortified foods and beverages on the market in the EU.

The results for the intake assessment of vegetable oil and EPA/DHA omega-3 oils are provided in Table 1 below.

Table 1. Summary of estimates of intake of EPA/DHA omega-3 oils and vegetable oil in the EU

Population group	Total intake (g/day)			
	EPA/DHA omega-3 oils		Vegetable oil	
	Typical ¹	Range ²	Mean	95 th percentile
Infants	1.79	1.11 – 2.47	8.6 - 25.8	28.4 - 45.7
Toddlers	0.86	0.40 – 2.50	10.3 - 25.9	24.3 - 47.7
Children			14.4 - 39.1	25.6 - 62.6
Adolescents	0.83	0.54 – 1.91	20.1 – 47.0	42.7 - 81.6
Adults	0.86	0.33 – 5.50	18.6 - 42.9	40.9 - 85.5
Elderly			15.5 - 40.8	34.9 - 88.8
Very elderly			17.4 - 34.6	42.9 – 86.0
Pregnant women	nc		18.2 - 35.8	40.0 - 81.1
Lactating women	nc		20.0 - 30.8	44.1 - 60.5
Vegetarians	nc		22.9	45.5

nc: not calculated

¹ Typical intake values for EPA/DHA omega-3 oils are based on the median intake from food supplements plus the intake derived from the volume of EPA/DHA omega-3 oils used in fortified foods/beverages in the EU (or infant formula for infants)

² The values for the range of EPA/DHA omega-3 oils intakes are based on the range of levels in food supplements plus the typical use of EPA/DHA omega-3 oil intakes derived from the volume of EPA/DHA omega-3 oils used for this category in the EU. For infants, the values presented represents the range in infant and follow-on formula.

¹ This includes the intake of fish oil, omega-3 concentrates and other marine oils such as krill oil, and microalgal oils.

Based on the intake assessment of vegetable oil in EU populations using the Comprehensive Database and the EFSA DietEx tool as described, it was shown that adolescents were the population group who had the greatest mean intakes of vegetable oil ranging from 20.1 to 47.0 g/day, while the elderly had the greatest 95th percentile intake of vegetable oil ranging from 34.9 to 88.8 g/day. Based on the compilation of data from the alternative data sources on levels of EPA/DHA omega-3 oils in foods consumed by EU population groups as described, intakes were shown to range from 0.33 to 5.50 g/day with the most likely or typical intakes being ~0.85 g per day for most population groups, and 1.79 g per day for infants (who consume a DHA-fortified infant / follow-on formula).

Comparing the estimated intakes of vegetable oil and EPA/DHA omega-3 oils across population groups, there is approximately a 50-fold difference in adults for the typical / mean intake (42.9 g/day compared to 0.86 g/day, respectively), and approximately a 15-fold difference for the 95th percentile / higher end of the range (85.5 g/day compared to 5.50 g/day, respectively).

There were some limitations in estimating both the vegetable oil and EPA/DHA omega-3 oils intakes. For example, detailed information on the amounts of vegetable oil used as ingredients in many processed foods and the composition of foods was not available for all countries contributing to the Comprehensive Database, therefore alternative recipe databases and manufacturer websites were used as the best approximation for vegetable oil content of each food. Since the actual composition of foods is likely to vary from country to country this may have resulted in an over- or an under- estimation of intakes. Also, methodological differences between surveys represented in the Comprehensive Database result in a large range in intake estimates between countries. The assessment of vegetable oil intakes used a conservative model, assuming vegetable oil was always present in a food if there was a possibility it might be which may also produce an overestimation of vegetable oil intakes.

For the estimation of EPA/DHA omega-3 oils, data were not available from national databases in the Comprehensive Database, so a range of sources were used to estimate intakes based on users of food supplements and fortified foods. Therefore, the results for the intake assessment of EPA/DHA omega-3 oils represent likely intakes of food supplement and/or fortified food users and may not be extrapolated to represent intakes for the entire EU population. However, by representing likely intakes of consumers of these products, the data presents a conservative estimate of true intake of EPA/DHA omega-3 oils in the EU. It should also be noted that the intake ranges include food supplements containing up to 5.5 g EPA/DHA omega-3 oils which are only recommended for special groups, for example people wanting to managing potential heart or blood pressure issues. Therefore, the upper end of the range of the intake of EPA/DHA omega-3 oils may represent an unlikely intake scenario, and the typical values represent a more likely intake level for EU population groups.