

## Aluminum Exposures from Diet and Vaccines in the First Six Months of Life

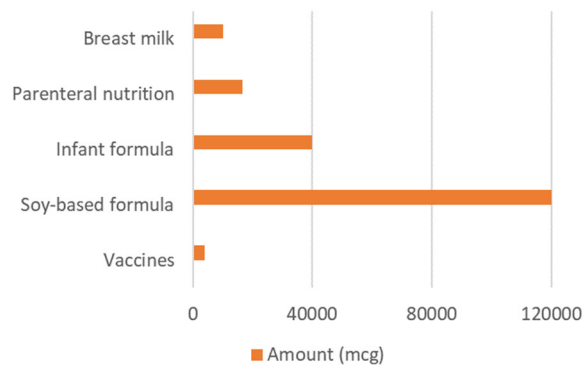
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**Background.** Claims exist that we are exposed to more aluminum from diet than from vaccines. It has already been established that this is not correct (Dorea et al., 2012). In this informational flyer, using the limiting effect of intestinal absorption rates, estimated at about 0.3% by Yokel (2010), and the fact that 100% of injected forms of aluminum is absorbed, we present total exposure to aluminum from various sources during the first six months after birth.

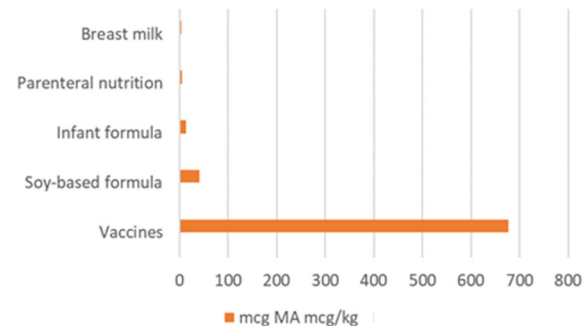
**Data.** Aluminum amounts from diet are derived from Fanni et al. (2014). Data on aluminum content of vaccines are derived from vaccine manufacturers' resources. The number of exposures to aluminum via vaccines is determined by the CDC Pediatric Schedule.

**Analysis.** Data are first presented as total amount due to each exposure source from diet and from the vaccine schedule. Data are then presented as micrograms corrected for metabolic exposure (100% for vaccines, 0.3% for dietary sources) and presented per kilogram body weight (micrograms/kilogram, assuming average 6-mo body weight of 5.91 kg). Finally, using whole-body clearance rates from Flarend et al. (1997), data are presented as total expected accumulation over six months using daily clearance and body weights.

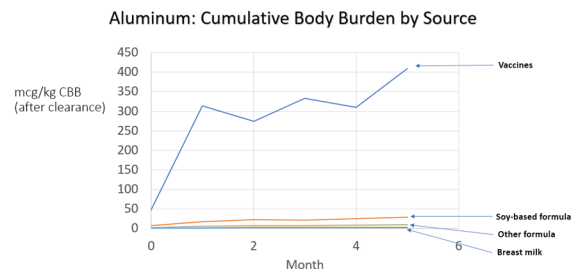
**Raw Intake.** The data presented as raw intake (total exposure) seem to indicate greater exposure from diet.



**Metabolic Exposure.** The data presented as Metabolic Exposure show that infants have greater exposure over the first six months from vaccines than from diet.



**Accumulation.** Per-month accumulation analysis from the various sources shows a greater expected accumulation from vaccines than from dietary sources.



## References

Dórea JG, Marques RC. 2010. Infants' exposure to aluminum from vaccines and breast milk during the first 6 months. *J Expo Sci Environ Epidemiol.* 20(7):598-601. doi: 10.1038/jes.2009.64.

Fanni, D et al. 2014. Aluminum exposure and toxicity in neonates: A practical guide to halt aluminum overload in the prenatal and perinatal periods. *World Journal of Pediatrics* 10:101-7.

Flarend RE et al. 1997. In vivo absorption of aluminium-containing vaccine adjuvants using <sup>26</sup>Al. *15(12-13):1314-8.* [clearance rate 4.6%/28 days]

Yokel, Robert A., "Aluminum in Food – The Nature and Contribution of Food Additives" (2012). *Pharmaceutical Sciences Faculty Publications.* 31. [https://uknowledge.uky.edu/ps\\_facpub/31](https://uknowledge.uky.edu/ps_facpub/31)

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