



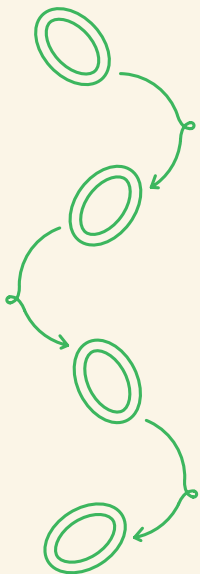
Manganese

INGREDIENT GUIDE

WHAT IS MANGANESE?

Manganese is an essential micronutrient thought to be important for processes all over the body. The immune system, brain development, bone development, and the metabolism of proteins, lipids, carbohydrates, and cholesterol all require manganese.³

Our bodies don't make manganese, so we have to get it from food. Manganese is found in leafy vegetables, whole grains, nuts, soybeans, shellfish, tea, and drinking water.¹ Babies get their manganese through breastmilk and formula. Because it's a trace micronutrient, we only need it in small amounts and deficiencies are quite rare.²



MANGANESE PLAYS A ROLE IN HEALTH OUTCOMES

Manganese is an un-sung hero in your baby's development. It plays an important role in the formation of your baby's bones and structures in brain and central nervous system. Manganese also helps with the regulation of nutrient metabolism and insulin levels, and it helps our bodies clear the by-products of stress from our cells.³

Manganese plays a role in bone development in early life.⁴ It has been shown to help support bone mineral density in adults, alongside other minerals important for bone health like calcium, zinc, and copper.⁵ Manganese is stored in our bodies in various organs. A large portion of it - 25 to 40% - is stored in our bones!⁸

Manganese is thought to support neurons send electrical signals in the brain.⁶ It could also protect brain cells from damage by helping to clear free-radicals. But too much manganese should be avoided, as excess amounts can negatively effect long-term cognition.²

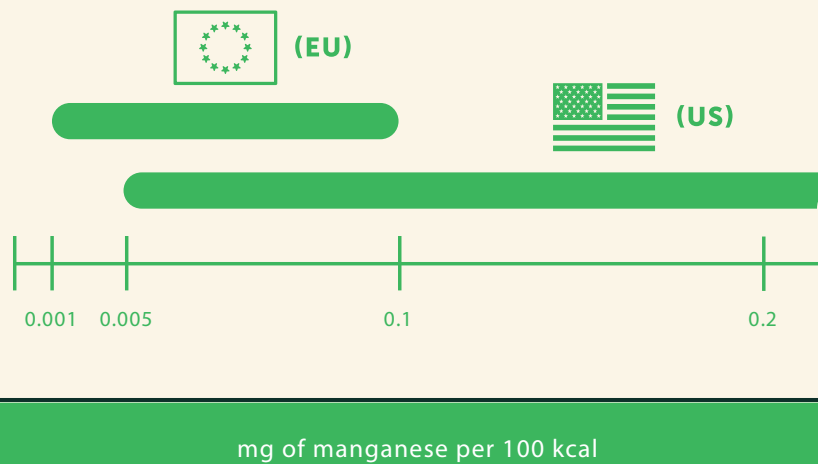
Manganese works together with vitamin K to help with blood clotting.² Manganese might even help prevent metabolic disease and illnesses related to inflammation^{7,2}.



REGULATIONS FOR INFANT FORMULA IN THE US AND EU

The Food and Drug Administration (FDA) requires that all infant formulas contain at least 0.005 mg of manganese per 100 calories, but an upper limit has not been set.⁸ The European Union requires that manganese in infant formula be greater than 0.001mg/100 kcal, but it cannot exceed 0.1mg/100 kcal.⁹ These minimum and maximum amounts provide guidance to help ensure that infants won't get too little or too much manganese from infant formula.

MANGANESE REGULATIONS FOR INFANT FORMULA



United States¹⁰ 0.005mg/100kcal minimum; no maximum
European Union¹¹ 0.001 -0.1 mg/100kcal

MANGANESE IN BOBBIE

Bobbie contains 0.015mg of manganese in every 100 calories of formula. Bobbie is the only American formula that meets the standards set by both the Food and Drug Administration (FDA) and the European Union.

bobbie
Med-02/21-TK-v.0

Manganese
0.015 mg per
100 kcal



TAKE-AWAY

Manganese is essential for your baby's health and development. Getting just the right amount is important. Bobbie has carefully chosen the level of manganese in our formula, and is the only American formula that follows both the FDA and EU guidelines for manganese concentrations in infant formula.

SOURCES

- Russell et al. (2001). Dietary reference intakes for vitamin A, vitamin K, arsenic, boron, chromium, copper, iodine, iron, manganese, molybdenum, nickel, silicon, vanadium, and zinc. A report of the panel on micronutrients, subcommittees on upper reference levels of nutrients and of interpretation and uses of dietary reference intakes, and the standing committee on the scientific evaluation of dietary reference intakes food and nutrition board Institute of medicine, 797.
- Aschner, J. L., & Aschner, M. (2005). Nutritional aspects of manganese homeostasis. *Molecular aspects of medicine*, 26(4-5), 353-362.
- Li, L., & Yang, X. (2018). The essential element manganese, oxidative stress, and metabolic diseases: links and interactions. *Oxidative medicine and cellular longevity*, 2018.
- Saltman, P. D., & Strause, L. G. (1993). The role of trace minerals in osteoporosis. *Journal of the American College of Nutrition*, 12(4), 384-389.
- Strause, L., Saltman, P., Smith, K. T., Bracker, M., & Andon, M. B. (1994). Spinal bone loss in postmenopausal women supplemented with calcium and trace minerals. *The Journal of nutrition*, 124(7), 1060-1064.
- Takeda, A. (2003). Manganese action in brain function. *Brain Research Reviews*, 41(1), 79-87.
- Korc, M. (1983). Manganese action on pancreatic protein synthesis in normal and diabetic rats. *American Journal of Physiology-Gastrointestinal and Liver Physiology*, 245(5), G628-G634.
- US Food and Drug Administration. (2017). CFR-code of federal regulations title 21.
- European Commission. (2015) Composition and information requirements for infant formula: Official Journal of the European Union
- US Food and Drug Administration. Title 21 Food and Drugs § 106 Infant Formula Requirements Pertaining to Current Good Manufacturing Practice, Quality Control Procedures, Quality Factors, Records and Reports, and Notifications; US Congress: Silver Spring, MD, USA, 2014.
- Commission Delegated Regulation (EU) 2016/127 of 25 September 2015 supplementing Regulation (EU) No 609/2013 of the European Parliament and of the Council as regards the specific compositional and information requirements for infant formula and follow-on formula and as regards requirements on information relating to infant and young child feeding (Text with EEA relevance). (2016). *Official Journal*, L 25, 1-29.