

Breastfeeding provides babies with iodine

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Iodine is essential for the healthy development of children. ETH-researchers now show that breastfeeding provides babies best with the iodine they need. Credit: Andrea Lingk / ETH Zurich

Iodine is essential for the human body. This trace element is especially crucial for infants in order to ensure healthy development. Iodine deficiency can disrupt growth and damage the nervous system. In iodine-poor regions, such as Switzerland with its iodine-deficient soils, iodised salt is recommended for use in cooking and the food industry. So newborns generally receive enough of the trace element through breast milk and baby food containing added iodine. However, iodised salt or supplemented baby food are not available everywhere, particularly in remote areas of developing countries, and do not always reach vulnerable segments of the population.

To ensure newborns receive enough of the trace element, the World Health Organisation (WHO) recommends that new [mothers](#) take one iodine capsule to provide a year's dose of iodine for the mother and child by way of breastfeeding. If breastfeeding is not possible, physicians give a lower concentration pill directly to the infant. The effectiveness of these two methods, however, had never been tested. For the first time, a team of researchers from ETH compared the direct administration of iodine with indirect nourishment through breast milk in newborns and monitored the iodine status of mothers and their babies over a one-year period. In the course of the study, they found that giving an iodine capsule to the mother is more effective than administering it to the child directly. However, both methods are insufficient to ensure that both mother and child receive enough of the trace element.

All reserves put into breast milk

Raschida Bouhouch, a PhD student in the Laboratory of Human Nutrition at ETH, and her colleagues conducted a blind study of 241 mother-and-child pairings in Morocco. Half the mothers were given an iodine capsule and the baby a placebo. The parameters were reversed for the other half of participants. The pills were administered along with the first vaccination given during the first eight weeks following birth. Over the next nine months, Bouhouch and her colleagues measured the iodine concentration in breast milk and urine of the mother and her child to determine their iodine status.

Although administration of iodine to the mother passed an astonishing amount of the trace element from the mother's breast milk to the child, the iodine concentration in the urine of the baby was well below the critical threshold just nine months after birth. In the case of the mother herself, the one-time dose was unable to remedy the [iodine deficiency](#) at any point in time. "The mother's body is apparently programmed to put all its iodine reserves into nourishing the child and does not keep

sufficient reserves for itself," explains Bouhouch. Shortly after birth, the infants had a much better iodine status than their mothers; however, the values were still under the minimum threshold needed by the body.

WHO recommendations inadequate

In the comparison, administration of iodine directly to the newborn was significantly less effective than indirect administration through breast milk. One reason for this might be that the child's body absorbs the trace element better when it is passed through [breast milk](#) than in a pre-processed form. The iodine status of the infants who received the capsule directly was usually below the threshold.

"That does not mean that direct iodine administration is not a good thing," emphasised Bouhouch. Both methods reduced disorders of the thyroid, which requires iodine in order to produce hormones in the infant. According to Bouhouch, WHO's recommendation still needs to be adjusted, however, as a one-time iodine dose is effective for only about six months rather than an entire year as previously thought. The iodine capsule is apparently insufficient to raise the mother's iodine status to a healthy level either. "It would be better to give the mothers iodine twice instead of only once a year." Even when iodine was administered directly to the infant, more regular and lower doses were reported to be preferable. The strategy undertaken in the study to give the iodine capsule regularly at the time of the first vaccination after birth is also a highly promising approach that could become an official recommendation.

In addition, the researchers led by Michael Zimmermann, ETH Professor of Human Nutrition and director of the study, are investigating how the high [iodine](#) dose is metabolised in the bodies of children and mothers. The reaction inside the body is still not fully understood.

More information: Bouhouch RR, Bouhouch S, Cherkaoui M, Aboussad A, Stinca S, Haldimann M, Andersson M, Zimmermann MB: Direct iodine supplementation of infants versus supplementation of their breastfeeding mothers: a double-blind, randomised, placebo-controlled trial. *The Lancet Diabetes and Endocrinology*, November 22, 2013. [DOI: 10.1016/S2213-8587\(13\)70155-4](https://doi.org/10.1016/S2213-8587(13)70155-4)

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