

Fluor and Iodine Commission: Annual Report 2018

Mission

Initially founded to accompany the developments in connection with the usage of iodized salt in Switzerland, the commission nowadays engages in scientific and technical questions concerning iodine and fluoride intake, monitors intake of these nutrients and concerns itself with political issues in this field.

Members

Prof. Michael Bruce Zimmermann, Zürich, Präsident
Dr. Maria Andersson, Zürich
Dr. Michael Beer, BLV representative, Bern
Prof. Hans Gerber, Bern
Prof. Christoph A. Meier, Basel
Dr. Giorgio Menghini, Zürich
Dr. Katharina Quack Lötscher, Zürich
Prof. Sabine Rohrmann, Zürich
Stefan Trachsel, Pratteln
Prof. Tuomas Waltimo, Basel

Activities 2018

The annual commission meeting took place at the ETH Zurich, on April 12, 2018. The commission members shared updates and strategies to improve iodine nutrition in Switzerland were discussed.

Salt sales statistics for 2018

The Schweizer Salinen AG (ST) shared the latest sales figures from 1990 to 2017 for iodized (I), iodized and fluoridated (I/F) and non-fortified salt (no I). Of all salt sold for human consumption in 2017, 61% of was iodized and 39% was non-iodized: 38% I salt, 23% I/F salt, 39% no I. Of the total salt sold in packages and tins, 98.7% is iodized and only 1.3% is non-iodized: 89.2% F/I salt, 9.5% I salt. Salt sold in bags (25 kg) and buckets (12.5 kg) is produced and sold as iodized salt only. The proportion of iodized to non-iodized salt sold to the food industry has not changed considerably over the past 4 years.

BLV updates

The Bundesamt für Lebensmittelsicherheit und Veterinärwesen (BLV: via MB) informed the commission that the French ban on iodized salt in imported cheese products has been lift-

ed. Iodized salt is now allowed in imported cheese products in France. BLV informed the Swiss cheese makers about this change in 2018 via Foederation der Schweizerischen Nahrungsmittel-Industrien (FIAL) and Agroscope.

BLV also informed that the Federal Department of Home Affairs (EDI) adopted a new food law in December 2016. Within this framework, the permitted level of iodine added to salt was extended from 20-30 mg/kg to 20-40 mg/kg, i.e. the maximum level of iodine was increased to 40 mg/kg salt (1). The current implemented level of fortification is 25 mg/kg salt.

Research updates

ETH Zurich (MA) presented an update of new research findings from ETH with relevance for iodine nutrition in Switzerland. The Swiss 2015 national iodine study show that the iodine intake is overall adequate in Swiss school-age children, but only borderline sufficient in pregnant and non-pregnant women, despite high salt intakes and satisfactory household coverage with iodized salt (2). The findings suggest increasing the concentration of iodine in salt may not improve iodine intakes in women if iodised salt is not widely used in processed foods. Another recent study show that salt iodization at 25 mg/kg that covers a high proportion of the total amount of salt consumed supplies sufficient dietary iodine to ensure adequate iodine nutrition in all population groups (3). The median UIC in Swiss children and women observed in the Swiss 2015 national study are only half of that observed in populations with mandatory iodisation (2), implying that the coverage in Switzerland is incomplete.

The data from the Swiss national iodine study suggest that a substantial proportion of the daily iodine intake may come from sources other than salt and partially compensate for the incomplete coverage of iodized salt (2). Cow's milk and dairy products are important sources of dietary iodine in the Swiss population, particularly in children (4). It was estimated that daily consumption of one glass (0.3 L) of Swiss milk (with a median milk iodine concentration of $\approx 87 \mu\text{g/L}$) would contribute $\approx 25 \mu\text{g}$ iodine (4, 5), i.e. a quarter of the recommended daily iodine intake for children. Subgroups not consuming dairy products may have particular low iodine intakes and be at high risk of iodine deficiency, as previously shown for vegans (6). The median iodine concentration in cow's milk produced in Switzerland is $87 \mu\text{g/L}$, but the variation is large and range from 5 to $371 \mu\text{g/L}$ (5). The main determinants of iodine in cows' milk in Switzerland are farm type, season and teat dipping (5).

Another recent study conducted by ETH Zurich proposed new reference ranges for breast milk iodine concentration during lactation (7). The breast milk iodine concentrations observed in Swiss lactating women is 3 times lower than in women with adequate iodine nutrition (8). The data suggest that Swiss infants may be at risk of iodine deficiency.

A recent randomized controlled trial (RCT) of prenatal iodine supplementation in mildly deficient pregnant women observed improved iodine status during pregnancy, but no long-term benefit on child development (9). The RCT did not provide support for iodine supplementation to pregnant women in mildly iodine deficient or borderline iodine sufficient populations, as is the case in Switzerland.

Proposed strategies to improve iodine nutrition – 2018 updates

Three strategies to improve iodine nutrition in Switzerland was proposed by the commission at its meeting in 2017. Updates and current stand was discussed at the 2018 meeting:

- a) *Further encouragement to the Swiss food industry to use iodized salt whenever possible*

The commission encourages BLV to continue the dialogue with Swiss food producers.

- b) *Potential recommendations for iodine supplementation to pregnant women*

KQL informed the commission that the Schweizerische Gesellschaft für Gynäkologie und Geburtshilfe (SGGG) is not planning to prepare specific guidelines or an expert letter recommending iodine supplementation to pregnant women as a recent RCT (9) did not provide support for targeted iodine supplementation in mildly iodine deficient and borderline iodine sufficient pregnant women on child development. However, women are recommended to use iodized salt during pregnancy.

- c) *A potential increase of the iodine concentration in Swiss salt from 25 to 30 mg/kg*

The committee unanimously stand behind this recommendation and support BLV/BAG for further action. At the 2018 meeting it was suggested to consider increasing the fortification level with 10 mg/kg to 35 mg/kg. The commission acknowledge that the previous increase from 20 to 25 mg/kg did not improve the overall iodine status in women of reproductive age and pregnant women and that a larger increase may be required.

New publications

The findings of the national iodine study were presented in two recent publications:

- Andersson M, Herter-Aeberli I (2018) Jodstatus in der Schweizer Bevölkerung [Iodine status in the Swiss population]. *Schweizer Ernährungsbulletin*; 2018: 63-83. (DOI: 10.24444/blv-2018-0111, available at: <https://www.blv.admin.ch/blv/de/home/lebensmittel-und-ernaehrung/ernaehrung/schweizer-ernaehrungsbulletin.html>)
- Andersson M, Hunziker S, Fingerhut R, Zimmermann MB, Herter-Aeberli I. Effectiveness of increased salt iodine concentration on iodine status: Trend analysis of cross-sectional national studies in Switzerland. *Eur J Nutr* (Accepted, Feb 6, 2019).

Outlook

1. The commission will meet for their annual meeting at ETH Zurich on March 22, 2019.
2. The major activities for 2019 will be support to BLV to encourage the dialogue with Swiss food producers for use iodized salt whenever possible in the food production. A potential increase of the iodine content in iodized salt from 25 ppm to 35 ppm will be discussed and investigated.



Maria Andersson for Michael Zimmermann, Zürich, February 28, 2018

References – New publications

1. EDI. Verordnung des EDI über den Zusatz von Vitaminen, Mineralstoffen und sonstigen Stoffen in Lebensmitteln (817.022.32) [in German], vom 16. Dezember 2016 (Stand am 6. Februar 2018). Bern: Eidgenössisches Department des Innern (EDI) [Federal Department of Home Affairs], 2018.
2. Andersson M, Hunziker S, Fingerhut R, Zimmermann MB, Herter-Aeberli I. Effectiveness of increased salt iodine concentration on iodine status: Trend analysis of cross-sectional national studies in Switzerland. *Eur J Nutr* 2019:Accepted Feb 6, 2019.
3. Dold S, Zimmermann MB, Jukic T, Kusic Z, Jia Q, Sang Z, Quirino A, San Luis TOL, Fingerhut R, Kupka R, et al. Universal salt iodization provides sufficient dietary iodine to achieve adequate iodine nutrition during the first 1000 days: A cross-sectional multicenter study. *J Nutr* 2018;148(4):587-98.
4. van der Reijden OL, Zimmermann MB, Galetti V. Iodine in dairy milk: Sources, concentrations and importance to human health. *Best Pract Res Clin Endocrinol Metab* 2017;31(4):385-95.
5. van der Reijden OL, Galetti V, Hulmann M, Krzystek A, Haldimann M, Schlegel P, Manzocchi E, Berard J, Kreuzer M, Zimmermann MB, et al. The main determinants of iodine in cows' milk in Switzerland are farm type, season and teat dipping. *Br J Nutr* 2018;119(5):559-69.
6. Schupbach R, Wegmuller R, Berguerand C, Bui M, Herter-Aeberli I. Micronutrient status and intake in omnivores, vegetarians and vegans in Switzerland. *Eur J Nutr* 2017;56(1):283-93.
7. Dold S, Zimmermann MB, Aboussad A, Cherkaoui M, Jia Q, Jukic T, Kusic Z, Quirino A, Sang Z, San Luis TO, et al. Breast milk iodine concentration is a more accurate biomarker of iodine status than urinary iodine concentration in exclusively breastfeeding women. *J Nutr* 2017;147(4):528-37.
8. Andersson M, Aeberli I, Wust N, Piacenza AM, Bucher T, Henschen I, Haldimann M, Zimmermann MB. The Swiss iodized salt program provides adequate iodine for school children and pregnant women, but weaning infants not receiving iodine-containing complementary foods as well as their mothers are iodine deficient. *J Clin Endocrinol Metab* 2010;95(12):5217-24.
9. Gowachirapant S, Jaiswal N, Melse-Boonstra A, Galetti V, Stinca S, Mackenzie I, Thomas S, Thomas T, Winichagoon P, Srinivasan K, et al. Effect of iodine supplementation in pregnant women on child neurodevelopment: a randomised, double-blind, placebo-controlled trial. *Lancet Diabetes Endocrinol* 2017;5(11):853-63.