INTERNATIONAL COUNCIL FOR CONTROL
OF IODINE DEFICIENCY DISORDERS

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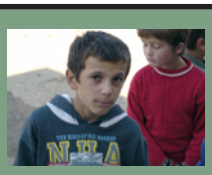
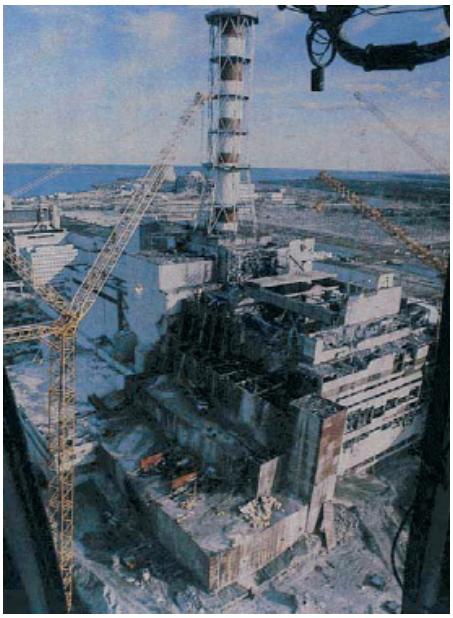


Togo's successful IDD control program protects newborns against brain damage from iodine deficiency. *(see page 10)*

Chernobyl 20th Anniversary: Adequate iodine could have helped to spare many children from thyroid cancer

On the 20th anniversary of the Chernobyl nuclear plant disaster, it is important to remember that the number of children who subsequently developed thyroid cancer from radiation exposure could have been significantly lower if they had been consuming iodized salt in their daily diet at the time of the accident. Considering the increasing use of nuclear power worldwide, this is another good reason to ensure adequate iodine intake for all children. Calling for universal salt iodization in an April 2006 press release, Maria Calivis, UNICEF Regional Director for CEE/CIS noted: "For the 4,000 children in question, iodized salt could have made all the difference. Many would have been spared from thyroid cancer. And amid all the other vast numbers - 400,000 people uprooted from their homes; five million still living in contaminated areas; 100,000 still dependent on humanitarian aid - it is too easy to overlook what is small: a drop of iodine costing just a few cents." The areas affected by Chernobyl were iodine deficient before the disaster, and are still iodine deficient today. Despite many efforts to get legislation passed on universal salt iodization (USI) in Belarus, the Russian Federation and Ukraine, the issue is still being debated. Even mild iodine deficiency during pregnancy can affect fetal brain development and, as a result, up to 2.4 million babies are born each year in Central and Eastern Europe and the Commonwealth of Independent States with mental impairment. UNICEF is urging the governments of Belarus, the Russian Federation and Ukraine to legislate for universal salt iodization and is working with salt producers and the general public to raise awareness of the importance of iodine.



Damaged Chernobyl nuclear reactor, 1986

Current IDD control efforts in Belarus are covered on pages 14-18 of this issue of the Newsletter.

The re-emergence of iodine deficiency in Australia

A national study confirms the existence of inadequate iodine intake in the Australian population, prompting calls for the urgent implementation of mandatory iodization of all edible salt.

Mu Li and Creswell Eastman ICCIDD Office for South East Asia and the Pacific

In 1992, the Australian Centre for Control of Iodine Deficiency Disorders (ACCIDD) reported median urinary iodine (UI) levels in the Australian population were >200 µg/L, consistent with iodine sufficiency. However, in recent years several studies from Victoria, New South Wales, and Tasmania have found median UI levels <100 µg/L. In surveys of pregnant women, median UIs have also been found to be well below 100 µg/L. Concerned by these data, ACCIDD conducted a national survey in 2003-2004 to document the population iodine nutritional status of schoolchildren in Australia.

A cross-sectional survey of 8-10 y-old schoolchildren was done, based on a one-stage random cluster sample drawn from all year 4 school classes in government and non-government schools in the five mainland Australian states of New South Wales (NSW), Victoria, South Australia, Western Australia and Queensland. Tasmania was excluded from the study because a voluntary iodine fortification program, using iodised salt in bread, is ongoing in that state; the Northern Territory was excluded for logistical reasons. The sample included 1709 students from 88 schools (881 boys and 828 girls). UI was measured in spot samples and thyroid volumes were measured by ultrasound. For much of the survey, data were collected by a purpose-built vehicle known as a "ThyroMobil" (Merck, Darmstadt, Germany), which had been used for studies of iodine nutrition in other countries.

The study found that, overall, children in mainland Australia are borderline iodine deficient, with a national median UI of 104 µg/L **(Table 1)**. On a state basis, NSW and Victorian children are mildly iodine deficient, with median UI levels of 89 µg/L and 74 µg/L, respectively. South Australian children are borderline iodine deficient, with a median of 101 µg/L. Both Queensland and Western Australian children are iodi-

Table 1: Distribution of urinary iodine excretion (UI) levels in Australian schoolchildren in 2003-2004 by state

State	n	M : F ratio	Age (y)[1]	Median UI (µg/L) (interquartile range)
NSW	427	1 : 1	9.3 ± 0.6	89.0 (65.0–123.5)
VIC	348	1 : 0.8	9.7 ± 0.5	73.5 (53.0–104.3)
SA	317	1 : 0.9	9.0 ± 0.5	101.0 (74.0–130.0)
WA	323	1 : 0.8	8.9 ± 0.6	142.5 (103.5–214.0)
QLD	294	1 : 1.3	9.1 ± 0.4	136.5 (104.3–183.8)
Total	**1709**	**1 : 0.9**	**9.2 ± 0.6**	**104.0 (71.0–147.0)**

[1] *Mean (SD). Iodine replete, UI ≥ 100 µg/L; mild iodine deficiency, UI 50–99 µg/L*

Table 2: Percentage of Australian children in 2003-2004 with thyroid volumes by ultrasound greater than the WHO 97th percentile[1], by state and gender

	Based on body-surface area (BSA (95% CI)		Based on age (95% CI)	
	Boys	*Girls*	*Boys*	*Girls*
NSW	3.9 (1.3–6.6)	7.1 (3.7–10.6)	6.4 (3.0–9.7)	10.0 (5.9–14.1)
VIC	0	0	0	0.7 (0–1.9)
SA	4.8 (1.6–8.1)	10.1 (5.2–14.9)	6.6 (2.8–10.3)	10.7 (5.8–15.7)
QLD	2.3 (0–4.9)	3.1 (0.4–5.8)	3.1 (0.1–6.0)	5.6 (2.1–9.2)
Total	**4.4 (3.0–5.8)**	**7.0 (5.2–8.7)**	**5.6 (4.0–7.1)**	**9.3(7.3–11.3)**

[1] *From reference: Am J Clin Nutr 2004; 79: 231-237.*

ne sufficient, with medians of 137 μg/L and 143 μg/L, respectively. Thyroid volumes in Australian schoolchildren are slightly increased compared with WHO reference values from children living in iodine sufficient countries **(Table 2)**. There was no significant association between UI and thyroid volume.

Children living in Western Australia and Queensland are clearly ingesting more iodine than their counterparts living elsewhere in Australia. The most likely explanations include: 1) possible differences in the proportion of the population using iodized salt; 2) variations in regional milk iodine content; and 3) drinking water iodine levels. These possibilities are currently being investigated. For example, drinking water samples collected during the survey showed relatively high iodine levels in water and milk in northern and central Queensland, which could explain why the UI levels indicated iodine sufficiency in this state.

The decline in iodine intake in Australia appears to be due to changes within the dairy industry. In Australia, the major sources of dietary iodine are milk and dairy products, seafood and iodized salt. Except in Tasmania, the food industry does not use iodized salt in the production and preparation of food. For decades, milk containing iodine residues from sanitising solutions (iodophors) used in the dairy industry has probably been the largest source of iodine in the Australian diet.

A 1975 survey of iodine concentration in milk conducted by the Australian Consumers' Association found mean concentrations of 593 μg/L and 583 μg/L. Because of concerns about iodine toxicity, Food Standards Australia and New Zealand specified an iodine limit of 500 μg/L in the Food Standards Code in 1982. Chlorine-containing sanitisers have gradually been replacing iodine-containing sanitizers in the industry.

As a result, surveys of the iodine content of milk samples from supermarkets around metropolitan Sydney in 2001 and 2004 showed lower levels, and iodine concentrations were highly variable. Median concentrations were 140 μg/L in 1991 (range, 60-220 μg/L) and 195 μg/L in 2001 (range, 66-412 μg/L). Iodine concentrations varied between samples of the same brand and type by up to 100 μg/L. Many samples contained <200 μg/L (10/13 in 2001 and 7/13 in 2004).

Thus, the perception that Australian milk is a rich source of iodine is no longer always true. A cup (250 ml) per day would provide at most 50-60 μg, approximately 1/3rd of the daily requirement of an adult. Despite these changes, dairy milk remains an important source of dietary iodine, and its content should continue to be monitored.

Another contributory factor to the re-emergence of iodine deficiency in Australia has been the decreasing consumption of iodized salt. Few if any food manufacturers use iodised salt in the preparation and manufacture of foods. It is alarming that mild iodine deficiency is extensive in Australian children and no action has yet been taken by public health authorities to increase iodine intake in the population. It is reasonable to assume that pregnant women and breastfeeding mothers are also iodine deficient, putting the next generation of children born in Australia at risk of the neuropsychological consequences of iodine deficiency. The implementation of mandatory fortification of all edible salt for human consumption is long overdue.

Authors note: In the wake of the publication of results of Australian National Iodine Nutrition Study, the authors would like to pay tribute to the late Professor John Dunn, former Executive Director of ICCIDD who helped initiate the study. At the 12th International Thyroid Congress in Kyoto, Japan October 2000, Dr. Mu Li presented data on UI from metropolitan Sydney, and, in discussions with Dr. Dunn, a national study to investigate the national iodine nutrition status was planned. Professor Dunn suggested using the Thyro-Mobil, considering the size of Australia, and started the negotiation with Merck to bring the ThyroMobil to Australia to conduct the study.

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Iodine nutrition in the U.S.

Although iodine intakes have decreased by 50% since the early 1970s, the U.S. remains iodine sufficient.

Elizabeth Pearce Boston University School of Medicine

Endemic goiter was eliminated in the U.S. following the initiation of salt iodization in the 1920s. The first U.S. National Health and Nutrition Examination Survey (NHANES I), conducted from 1971-1974, reported a median urinary iodine (UI) for the U.S population of 320 µg/L, reflecting adequate to excessive dietary iodine intake (1). By the time of NHANES III in 1988-1994, however, the median urinary iodine had fallen to 145 µg/L. The reasons for this decrease in U.S. dietary iodine intake are not clear, although some possible explanations are discussed below. Fears that this trend would continue have prompted further monitoring, but the most recent NHANES survey, conducted from 2001-2002, found that the median UI has stabilized at 168 µg/L (2).

Between the NHANES I and NHANES III surveys, the risk for iodine deficiency increased most among women of childbearing age (15-44 years) (Figure 1). In particular, the median UI in pregnant women (n = 208) from NHANES I was 327 µg/L, with 1% of the women sampled having UIs < 50 µg/L. The median UI among pregnant women from NHANES III (n = 348) was 141 µg/L, with 6.9% having UIs <50 µg/L. The most recent NHANES survey, conducted in 2000-2001, demonstrated that UIs in pregnant women appear to have stabilized: the median UI was 173 µg/L for the 126 pregnant women sampled, with 7.3% having UIs <50 µg/L (2). In a recent survey of 100 healthy pregnant women in the Boston area, the median UI was 149 µg/L, with UIs ranging from 13 - 1200 µg/L (3). Current data regarding iodine sufficiency among lactating women are very limited. Breast milk iodine content was measured in a sample of 27 lactating women in the Boston area in 2002; the median value was 157 µg/L (E. Pearce, unpublished data). In contrast, a small study found a median breast milk iodine value of 33.5 µg/L in a sample of 23 women recruited via the internet (4).

Several studies have reported UI levels in school-age children over the past several decades. At the time of NHANES I, the median UI for children aged 6-11 was 421 µg/L; this value had fallen to 237 µg/L by the time of NHANES III. Since then, UI in U.S. children, as for other groups, appears to have stabilized. The median UI in a 1996 sample of 302 Atlanta children was 282 µg/L (5); that in a 2002 sample of 565 Boston-area children was 289 µg/L (6); and that in the most recent NHANES survey (2001-2002; n = 374) was 249 µg/L. UI values in school-age children are consistently higher than those of adults, and UI values are consistently higher in boys than in girls.

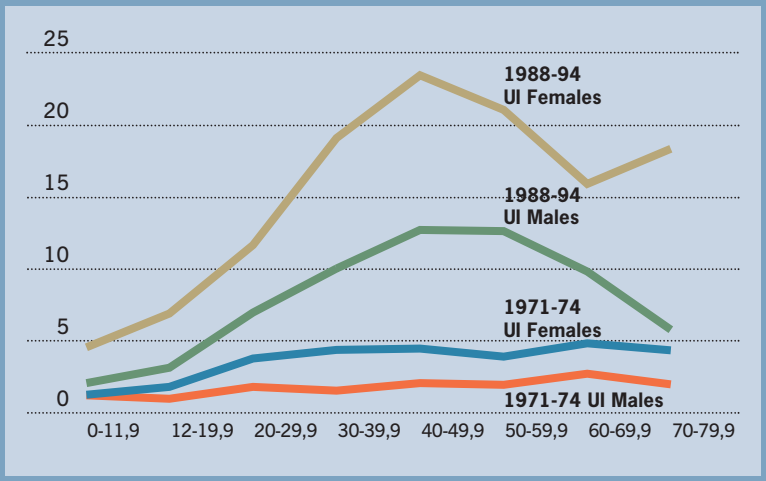

Figure 1:
U.S. population with urinary iodine <50 µg/L: NHANES I and NHANES III

Sources of Iodine in the U.S. Diet

Sources of iodine in the diet of U.S. adults have been difficult to identify, in part because there are a wide variety of potential sources and food iodine content is not listed on packaging. Approximately 70% of salt sold for household use is currently fortified with 100 ppm potassium iodide. However, it is estimated that household table salt accounts for only about 15% of daily salt intake, and the salt used in manufacturing of many processed foods may not be iodized. Possible reasons for the decrease in iodine consumption between the early 1970s and the 1990s include recommendations for reduced salt intake for blood pressure control, and increasing use of non-iodized salt in manufactured or "premade" convenience foods (7).

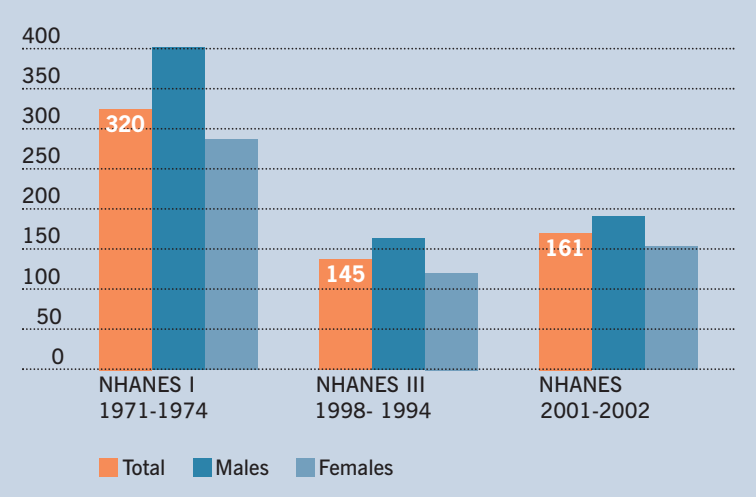

*Figure 2: **Median urinary iodine concentration in the U.S. 1971-2002***

The iodine content of milk in the U.S. increased by 300-500% over the period from 1965 to 1980, largely due to changes in cattle feeds (8). A limitation of the allowable amount of organic iodine ethylenediamine dihydroiodine (EDDI) in cattle feed in 1986 resulted in decreases in the iodine content of cows' milk, another probable reason for the decrease in US dietary iodine intake between the 1970s and 1990s. Iodine is also introduced into cows' milk by the use of iodophor disinfectant, pre- and post-milking teat dips and udder washes. The iodine content of 18 varieties of cows' milk from Boston-area supermarkets was recently measured, and the average iodine content of milk in this sample was 464 µg/L (9).

Commercially-baked breads may have been another major source of iodine in the U.S. diet. Conditioners are added to store-bought bread to maintain freshness and prolong shelf life. In the 1960s, iodate bread conditioners were widely used. London et al in 1965 reported that bread was a source of large quantities of dietary iodine (10). This was considered to be a contributing cause to decreasing radioactive iodine uptake in the U.S. during the 1960s (11). Because of concerns about high bread iodine content, commercial bakeries now less commonly use iodate bread conditioners. The decreasing use of iodate bread conditioners is thought to have contributed to the reduction in dietary iodine levels between the 1970s and the early 1990s. In 2002 the iodine content of 18 different breads from Boston-area supermarkets was measured (9). Three varieties of bread contained >300 µg iodine per slice (316 to 587 µg), while the average iodine content in the other 17 brands was 10 µg iodine/slice. The labeling of bread packages did not accurately predict their iodine content.

The iodine content of eight varieties of infant formula sold in the Boston area was recently measured, and values ranged from 16 µg to 57 µg iodine per 5 oz. serving (9). Thus, infants who are exclusively formula-fed likely consume adequate iodine. Other sources of iodine in the diet are eggs, meat, and poultry. Erythrosine dye (FDC Red #3) is sometimes described as a major contributor to U.S. dietary iodine intake, but this is probably not the case because this colorant is no longer widely used in U.S. foods, and the iodine contained in erythrosine is not readily bioavailable (12).

In 1924, Morton Salt, the leading U.S. salt producer, introduced iodized table salt to help prevent goiter, a widespread health problem in the U.S. at that time.

Finally, multivitamins may be another important source of iodine in the U.S. Of the various formulations on the market, 51% of adult multivitamins contain iodine; most of those include 150 µg daily (13). Forty five percent of children's multivitamin formulations contain iodine, while none of the infant liquid multivitamin formulations contain iodine (13). Currently, only 44 of 69 (64%) types of prenatal multivitamins marketed in the U.S. contain any iodine; of those, 85% contain 150 µg. Based on concerns about adequate iodine intake in the perinatal period, the National Academy of Sciences recently recommended that consideration be given to adding iodine to all prenatal vitamins (14).

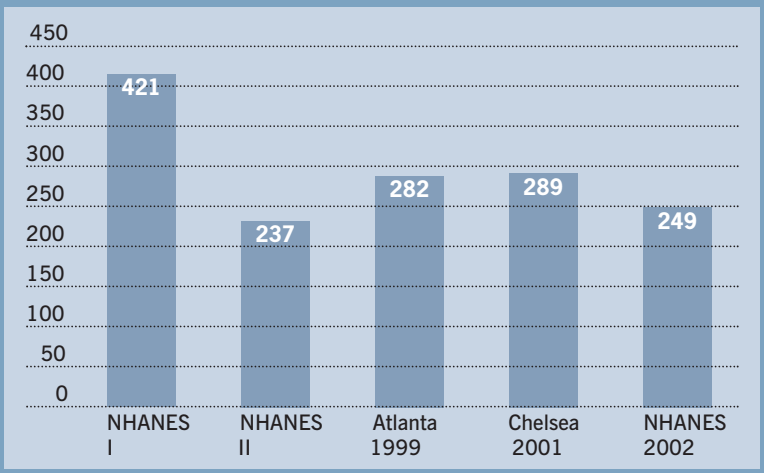

Figure 3:
Median urinary iodine (µg/L) in U.S. school children in recent studies

Conclusions

■ Although iodine intakes appear to have decreased by 50% since the early 1970s, the U.S. remains iodine sufficient.

■ There are concerns about the increased prevalence of low urinary iodine values among women of childbearing age.

■ There is wide variation in the iodine content of some common foods, and the iodine content of foods is not well-presented on package labels.

Recommendations

■ There needs to be increased awareness of the importance of adequate iodine nutrition, particularly during pregnancy and lactation, among the U.S. public.

■ Accurately identifying iodine content on food package labels would facilitate this process.

■ Women of childbearing age should be encouraged to use iodine-containing multivitamins.

■ Finally, there is a need for larger and more systematic studies of iodine nutrition in different U.S. populations and for routine monitoring of food iodine content.

(Adapted from E. Pearce, Iodine Health in the United States in 2005, in the *Clinical Endocrine Update Syllabus*, Endocrine Society Press, 2005, with permission)

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Combating IDD in Ghana

Ebenezer Asibey-Berko, Rebecca Ahun, Tamar Schrofer and Ernestina Agyepong ICCIDD Ghana

Following the Dakar consultations on USI for West Africa in October 2004, the following objectives were set for progress on USI in Ghana:

1. Secure high-level political commitment to USI
2. Ensure all salt produced in Ghana is effectively iodised
3. Monitor and enforce the salt iodisation law
4. Increase national awareness of the benefits of iodised salt
5. Strengthen partnerships

Securing high level political commitment

In this effort, The Ministry of Health and Ghana Health Services, worked in collaboration with the National Salt Producers Association, the office of the Presidential Special Initiative on Salt, UNICEF, the Ministry of Local Government and Rural Development, the Ghana Education Service and the Ministry of Environment and Science. Aliu Mahama, the Vice President of the Republic, launched Ghana's USI program at the national level on February 9, 2005. It was well attended by the public, media and interest groups. This was followed by launches in four regions that had low rates of USI in a 2003 survey. Two more regional launches followed in the Upper East and Northern regions in October 2005. The UNICEF representative, Dorothy Rozga, and Prof. Badu Akosa, Chairman of the National Iodisation Committee and Director General of the Ghana Health Services, visited the office of the Vice President of Ghana to update him of progress towards USI.

Figure 1: ***Officers from the Ghana Food Research Institute teaching methods of salt iodization to producers***

Ensuring the iodisation of all Ghanaian salt

The Food and Drugs Board (FDB) is to lead in this activity with the support of the Ministry of Trade and Industries, Presidential Special Initiative on Salt, Ghana Standards Board and the Food Research Institute. The Food and Drugs Board developed and distributed a Code of Practice to all salt producers, traders, transporters and stakeholders in November 2005. This spelled out the standards expected of all in the industry. A shortage of potassium iodate (KI) in the country in January 2005 was a threat to progress, but arrangements were made for Mina Chemicals, a private chemical dealer, to import KI into the country. UNICEF also procured KI for a training program, run by the National Salt Iodization Committee, to iodize heaps of salt that had accumulated in parts of the country. Salt producers and National Disaster Mobilisation Organisation coordinators were trained in simple manual iodization methods in six regions, using accumulated stocks of uniodised salt. After training, a free portable sprayer, iodised salt spot test kits, potassium iodate and other supplies were given to the trainees to allow them to go and iodize their heaps of salt. The free supplies were provided by UNICEF. Plans were also put in place to locate and iodise non-iodized salt awaiting sale at the markets.

Monitoring and enforcing the salt iodization law

The Food and Drugs Board was to lead this activity with the collaboration of the Ghana Health Services, the Customs and Excise Prevention Services, the Ministry of Local Government and rural Development, and the Micronutrient Initiative (MI).

Figure 2: ***Promoting iodized salt to women salt traders at a market in the Volta Region of Ghana.***

Salt sampler distribution. Two hundred and forty salt samplers were procured for enforcement. They will be used to collect salt samples from salt sacks at road checkpoints to be tested for iodine.

Factory inspections. In December 2005, the Food and Drugs Board began factory inspections to ensure adequate salt iodization at the factories.

Permit for raw salt movement and checking of salt at road check points. The Food and Drugs Board developed a permit that must be completed to transport raw salt, and the quantity and final destination of the salt must be on the permit. Several large national salt producers are already complying. Over 500 customs and police officers have been trained to check the iodization status of salt with spot-test kits and identify the movement of iodized and non-iodized salt. A ceremonial handing-over of 5000 salt spot-test kits to enforcement personnel took place in October, 2005.

Checks at production/refining plants. In December 2005, the Food and Drugs Board started visiting salt production plants to see their facilities. Samples of their salt was collected and sent to accredited laboratories for analysis of iodine content by titration.

Increasing awareness and mobilising for positive behavior change

The Ministry of Health led this activity, assisted by the Ghana Health Services, UNICEF and the Ghana Education Service.

KAP study. To identify knowledge gaps to target for public education, a KAP (Knowledge, Attitudes and Practices) study was conducted on the "Salt Habits of Ghanaians", sponsored by Unilever Ghana.

Developing a communication strategy. Prototype campaign materials have been pre-tested, mass produced and distributed. The Food and Drugs Board is developing a documentary on USI for TV, and vans from the Ministry of Information will visit Ghanaian communities to show the documentary and educate the public.

IDD / USI education in schools. The Ministry of Education is training School Health Officers on the importance of salt iodisation at over 1500 schools in 4 regions.

Strengthening partnerships

The National Salt Iodization committee, with members from various stakeholder groups, held nine meetings in 2005. To ensure smooth running of salt committees around the country, guidelines for salt committees have been developed by the Ghana Health Services and the Nutrition Unit. A reorganisation of the National Salt Producers Association of Ghana is underway through the office of the Presidential Special Initiatives on Salt. This should increase government recognition of the group and make it easier for the group to import KI for its members.

Ghana was represented in July 2005 at a consultative meeting with ECOWAS partners in Burkina Faso. The meeting discussed standardization of salt, quality control, trade and taxation within the framework of USI in West Africa. The meeting agreed on the following:

- To apply the standards of the Economic and Monetary Union of French West African Countries (UEMOA) for iodated salt, and use the same methods for assessing salt iodine content.
- To identify four laboratories in the sub-region (Ghana, Cote d'Ivoire, Nigeria and Senegal), and strengthen their capacities to serve the subregion. The office of the Ghana Presidential Special Initiative on Salt is to strengthen the capacity of the Ghana Reference Laboratory.
- To adopt the fiscal provisions of UEMOA in relation to iodised salt, KI, and salt iodisation equipment. UEMOA should in turn modify its tariff and suppress its taxes to facilitate iodated salt trade in the region.

Figure 3: ***A demonstration of spraying iodine on salt at Bawku, Upper East Region of Ghana.***

Figure 4: ***Mixing salt sprayed with iodine in central Ghana.***

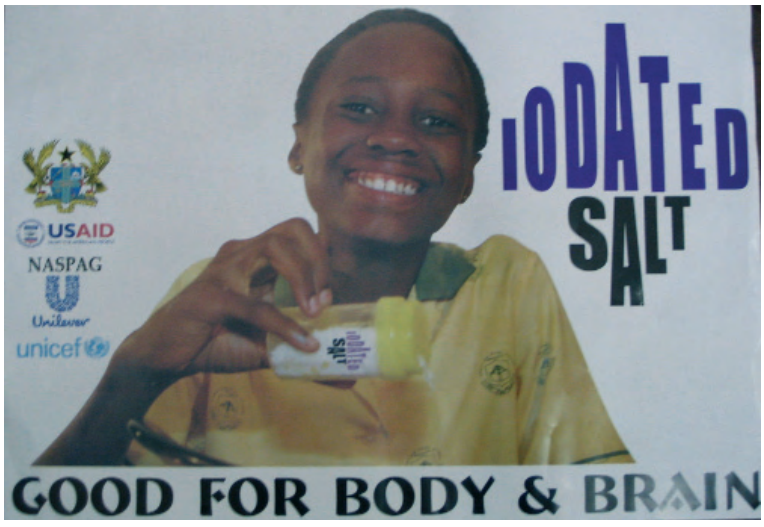

Figure 5: ***Promotion of iodized salt in Ghana***

Other Activities

The Micronutrient Initiative helped appoint for UNICEF a USI program officer, Rebecca Ahun, in Accra. A journalist has been engaged by UNICEF to report on the USI programme and prepare press releases.

Current Situation

In November 2005, a UNICEF consultancy reviewed the Ghana's USI strategy. It noted a high (85%) population awareness of salt iodisation, but only limited (50%) access to iodised salt. Their main recommendation was for Ghana to quickly maximize production and market supply of iodized salt. To check the extent of household coverage at the end of 2005, a national survey was done by the Ministry of Health and Ghana Health Services. The survey covered all regions of Ghana, and its results will be available soon.

Elimination of IDD in Togo

Recent data suggest Togo has eliminated of IDD as a public health problem in the year 2005.

Théophile Ntambwe Kibambe Sub-regional Coordinator for ICCIDD in Francophone Africa

Background

A national screening in 1986 reported a goiter prevalence of 18.4% in the general population of Togo, indicating mild-to-moderate IDD nationwide. However, several regions suffered from moderate and severe goiter, especially in the Savannah regions, Plateau and Kara. The fight against IDD began with the administration of Lugol solution (potassium iodide) to goitrous subjects in 1986-89. This was followed by distribution of Lipiodol capsules to vulnerable groups in severely endemic regions from 1990-1995. In 1995, a nationwide multiple indicator study (MICS I) found only 1% of household salt was iodized.

The strategy of USI in Togo was adopted on May 1996, based on an interministry decree, with regulations on importation, production, distribution and utilization of food grade salt. The strategy was supported by awareness campaigns, education of salt controllers, and other measures. In 1998, the demography and health survey in Togo found 73% of household salt was iodized, but with great disparities on a regional level, e.g., coverage was 81% in Kara, but only 22% in the Savannah region.

In October 1999, a survey was done as part of the ThyroMobil project in 4 West African countries (Benin, Burkina Faso, Mali, and Togo). Ultrasound was used to measure thyroid volume for determination of goiter rate in 6-12 y-old children. The results suggested a significant reduction of IDD in the formerly endemic areas, but the study was done in sites that were relatively accessible and thus not nationally representative. The 2000 MICS II survey found 67% of household salt was iodized at a level >25ppm on a national level, up from 1% coverage just 5 years earlier.

In 2001, the Ministry of Health did a national survey to evaluate progress in IDD control. The study found 75% of household salt was adequately iodized, and the prevalence of goiter was 7.2%, indicating mild IDD in the population. On the regional level, IDD was mild in the Savannah region, the Kara, and the Plateau, with goiter rates 7-14%, and was absent in the Maritime and Central regions with goiter rates <4%. In July 2003, a national revision of regulations on monitoring of iodized salt was done, and a reemphasis placed on sustaining efforts to eliminate IDD.

The 2005 National Study

A comprehensive study to evaluate progress against IDD, coordinated by the General Health Director and supported financially by UNICEF, was incorporated into the action plan of the National Nutrition Service of Togo for 2005. A technical committee was responsible for organizing a coalition of experts to accomplish the study. The committee included the Ministries of Health and Education, the faculty of sciences of Lomé University, the General National Directorate of Statistics and Accounting, UNICEF and WHO. This president of the technical committee was T Ntambwe, the Sub-regional Coordinator of ICCIDD in Francophone Africa.

The general aims of the study were to determine:

- the coverage of iodized salt at the household level and its content
- the median urinary iodine and the goiter prevalence in the population
- the level of awareness in the population on iodine deficiency
- the establishment of a monitoring system for iodized salt

Challenges encountered

■ The poor quality of many roads made access by car to remote sites in rural areas difficult. Because 4-wheel drive vehicles were not available, access to some sites was accomplished by motorcycles.

■ In many provinces in the rural zones, the exact age of children was unclear. The age of the child was estimated based on information from teachers and the fact that children are enrolled into the educational system at age 7 y. As a consequence, children's ages were likely underestimated.

■ Several schools selected from school lists available in Lomé could not be located and were replaced by other schools in the same province.

Coverage of iodized salt

Tables 1 and 2 show the iodine content in household salt based on titration of 900 samples. Over 92% of households had access to adequately iodized salt. The mean iodine content in household salt was 49.7 ppm, at the upper limit of the UEMOA/WAHO norms adopted in July 2005 in Ouagadougou, where it was recommended that the iodine content of household salt be in the range of 30-50 ppm. However, there are regional variations. Inadequately fortified salt (<15 ppm) was found mainly in the coastal western area and the Lomé community, whereas in the dry and humid Savannah zones, levels of iodine were too high (>100ppm).

Urinary iodine levels

Tables 3 and 4 show the UI concentrations in 1339 samples from schoolchildren aged 6-12 y. The national median UI is 171 µg/L, indicating iodine sufficiency. By region, Table 4 shows that 40-58% of samples contained higher than recommended levels of iodine (>200 µg/L) on the east and west coast and in the Lomé community.

Table 1: Mean iodine content of household salt in different regions of Togo in 2005

Geographical area	Mean iodine content in salt (ppm)
Dry Savannah	64
Dry Atakora	58
Humid Atakora	42
Humid Savannah	71
Humid Forest	37
Coastal East	49
Coastal West	31
Lomé community	39
Total	**49.7**

Table 2: Proportion of household salt by concentration in different regions of Togo in 2005

Geographical area	< 15 ppm	15-100 ppm	> 100 ppm
Dry Savannah	3,3 %	82,5 %	14,2 %
Dry Atakora	1,1 %	88,9 %	10,0 %
Humid Atakora	6,7 %	87,8 %	5,6 %
Humid Savannah	9,2 %	70,8 %	20,0 %
Humid Forest	5,8 %	92,5 %	1,7 %
Coastal East	2,7 %	94,7 %	2,7 %
Coastal West	15,0 %	83,3 %	1,7 %
Lomé community	14,0 %	81,3 %	4,7 %
Total	**7,0%**	**85,3%**	**7,7%**

Table 3: Median UI (µg/L) in school children by region in Togo in 2005

Geographical area	UI median
Dry Savannah	164,7
Dry Atakora	157,3
Humid Atakora	152,5
Humid Savannah	188,1
Humid Forest	157,5
Coastal East	215,8
Coastal West	192,7
Lomé community	182,7
Total	**171,4**

Table 4: Proportion (%) of UI by concentration (µg/L) in school children in Togo, by region, in 2005

Geographical area	< 50	50-99	100-199	200-300	300
Dry Savannah	1,7	7,8	63,9	23,3	3,3
Dry Atakora	0,0	5,2	81,5	13,3	0,0
Humid Atakora	0,0	3,0	83,0	13,3	0,7
Humid Savannah	0 ,0	2,2	57,3	33,1	7,3
Humid Forest	0,0	1,7	81,8	16,6	0,0
Coastal East	5,0	4,1	33,2	40,6	17,1
Coastal West	2,2	1,1	48,9	37,8	10,0
Lomé community	0,8	10,3	48,4	28,3	12,1
Total	**1,3**	**4,9**	**60,6**	**26,3**	**6,9**

Table 5: Goiter prevalence by geographic

Geographical area	Number children
Dry Savannah	924
Dry Atakora	693
Humid Atakora	693
Humid Savannah	924
Humid Forest	924
Coastal East	1155
Coastal West	462
Lomé community	1155
Total	**6930**

Goiter prevalence

Table 5 shows the goiter prevalence assessed by palpation and inspection in 6930 children aged 6-12 y. The national prevalence of goiter in this age group is 2%, indicating iodine sufficiency.

IDD Awareness

Interviews on IDD awareness in the adult population were done in villages in each of the 30 provinces in the survey, in men and women in both urban and rural areas. In general, the interviewed subjects recognized goiter, but were uncertain on its cause; often, the water of the neighboring river or the rain was blamed, or certain foods (e.g., egg plant), or bacteria or parasites, or the general environment. Generally, knowledge of the cause of goiter was poor. Similarly, awareness of iodized salt was low in the population. Its benefits for health and its sources for purchasing were unknown by the majority, many who were not even aware that iodized was available on the local market. Women did not express a clear preference for certain salt types, except for some who are guided by the color (grey vs. white salt) and think that grey salt contains more iodine. By region, in the dry Savannah and dry and humid Atakora, IDD awareness is generally higher than in the humid Savannah, humid forest and the Lomé community. Men appeared to have better knowledge of IDD than women.

When asked about the attitude of the population to IDD, goitrous persons are often stigmatized, and treated with pity or mockery. Some keep their distance from goiters in fear of being infected. Men generally had a more positive attitude toward goitrous people than women. The majority of the interviewed persons responded that there was no locally available remedy to treat goiter. Several recommended the use of traditional medicine: neck massage, application of herbal mixtures on the goiter, wearing of special collars, etc. Regarding the storage conditions of household salt, women generally stored it in the kitchen or the sleeping room, in various containers of plastic, glass or metal (bottles, cans, canisters, cups) or in well-closed plastic bags, away from the fireplace.

Iodized salt monitoring system

In a survey of custom offices nationwide, most did not control iodine levels in imported salt. Only a few had received training to control iodized salt according to established standards and most did not have the appropriate testing materials. The Services of Hygiene and Sanitation were also contacted. Although hygiene service agents are responsible for performing the controls at the market level, most did not have enough valid fast-check kits, and complained of a lack of available transport, skilled personnel and harmonized support for the data collection. There was a clear lack of regular collaboration between different public services in charge of iodized salt monitoring.

area in Togo in 2005.

of	Number of goiters	Goiter prevalence (%)
	62	6,7
	22	3,2
	2	0,3
	13	1,4
	21	2,3
	15	1,3
	0	0,0
	5	0,4
	140	**2,0**

Table 6: Progress in the elimination of IDD

Indicator	Aims	Achievements
Iodized salt		
Percentage of households using iodized salt	> 90 %	92,1 %
Urinary iodine		
Median UI	100 – 200 µg/L	171,4 µg/l
Proportion < 100 µg/l	< 50 %	6,2 %
Proportion < 50 µg/l	< 20 %	1,3 %
Goiter		
Goiter prevalence in children aged 6-12 y	< 5 %	2,0 %

Recommendations

Togo has eliminated IDD as a public health problem on a national scale. However, there remains the problem of non-iodized salt and persistence of mild endemic goiter in the dry Savannah region of Togo. Special efforts to stop the importation of non-iodized salt need to be made. On the other hand, a significant proportion of salt and urine samples in a few provinces showed iodine contents that were too high, emphasizing the need for careful regular monitoring of IDD nationwide.

To the government of Togo:

- to organize an intersectoral monitoring committee covering all the involved institutions and to free the resources needed for its functioning on a central, regional and provincial level
- to adopt the interministry decree proposed in 2003 to regulate the production, importation and utilization of iodized salt
- to reinforce the regulatory control of iodized salt at borders and on the market by the custom and health services, including rigorous legal enforcement
- to provide the National Reference Laboratory (National Institute of Hygiene) with technical and logistical capacities for the assessment of iodine in salt and urine
- to increase awareness of the benefits of iodized salt through sensitization campaigns in the media
- to integrate the message of IDD control into the curricula of the primary and secondary schools
- to integrate indicators of IDD elimination into the national system of health information, in particular the household coverage of iodized salt
- to ensure annual surveys of iodine status in risk-prone regions
- to report every third year on nationwide IDD status
- to support operational research in the field of eliminating IDD

To the salt importers:

- to verify iodized salt quality prior to purchase from industrial or small-scale plants
- to organize themselves in decentralized associations around the country
- to sell solely iodized salt on the national markets

To the media, NGO's, consumers, and opinion leaders:

- to participate in the promotion of iodized salt nationwide, in collaboration with the health services and other involved sectors

Progress against IDD in Belarus

S. Sivuha and A. Lyashkevich Consultants, UNICEF Office Belarus

Background

The Government Program for Iodine Deficiency Prevention in Belarus was suspended in the early 1990s after the break-up of the Soviet Union. The output of iodized salt produced by Belarusian companies at that time could satisfy <14% of the country's needs, and salt quality was generally poor. A comprehensive survey of iodine deficiency was conducted in 1997-1999 including twelve thousand children and adolescents with the support of WHO. The median urinary iodine (UI) was only 44 μg/L, and in some regions, it was as low as 27 μg/L. The consequences of iodine deficiency were especially acute for Belarus as many people were affected by radiation exposure as a result of the Chernobyl accident (see separate article in this issue of the Newsletter). Low iodine intakes in a population increase the risk of radioactivity damaging the thyroid gland and causing thyroid cancer. Public interest in iodine increased during the first few years after the Chernobyl accident, as people became aware of this connection, and there was widespread use of prophylactic pharmaceutical iodine. Humanitarian aid programs distributed potassium iodide capsules in schools and day-care centers. At the same time, many housewives did not purchase salt iodized with potassium iodate, as they incorrectly believed that it worsened the taste of food.

The program for IDD elimination

A comprehensive program for combating IDD was developed in 2000 by a team of public health officials and endocrinologists, with the support of WHO and UNICEF. The program, supported by the Ministry of Health, was used as a basis for the resolution adopted by the Belarusian Government in April 2001. The resolution stipulated iodized salt should be used in food production (except for ocean fish and seafood processing) and catering, as well as be available in all retail outlets. The resolution did not ban import and sales of non-iodized salt. Although salt iodization in the food industry was made mandatory, because of strong opposition in some government bodies, table salt iodization was made voluntary. Another important aspect of the program was an advocacy campaign in the media, health facilities and educational institutions.

The Ministry of Health was designated as responsible for regular monitoring of all components of the IDD control program, including monitoring of the quality of salt. The iodine fortification level (40±15 ppm as potassium iodate) was approved in 2000 by a resolution of the Senior Sanitary Doctor of Belarus. The sanitary and epidemiological services of Belarus supervise iodized salt production, storage and distribution conditions and its use in food production. This control is already in place during approval of technological specifications for food production. District sanitary doctors are instructed to inspect each food producer and catering facility at least once a year. In 2003, it was estimated that only 40-70% of food producers used iodized salt in districts of the Brest region, and the percentage was lower for state-run enterprises and higher for private companies.

Although iodized salt is included in the mandatory list of goods which should be available in all retail outlets, several districts have low availability of iodized salt in the retail network; e.g. in 2003, only 12% of shops in three districts of the Vitebsk region had iodized salt available. Spot-check inspections of retail outlets conducted in 2004 found <1% of salt samples produced by Belarusian companies did not meet the salt composition requirements, but for salt imported from Ukraine, 8.6% of samples failed to meet the norms. Fines are imposed for a failure to implement the Government Resolution. In 2003, administrative penalties were imposed on 62 food enterprise managers, and this has helped ensure compliance at the enterprise level, but at the district level, the changes are fairly slow. The Government and local authorities are informed quarterly on the results of monitoring program.

Salt production and iodization

In Belarus salt is produced by two companies: "MozyrSalt" and "BelarusKaliy". Their potential production capacity is six times higher than the country's needs and practically all salt can be iodized, if needed. The "MozyrSalt" Company employs modern technologies for salt production using iodization and packaging facilities supplied by UNICEF and TACIS. The production, packaging and laboratory control of quality meet the international standard ISO 9002-03. In contrast,

table salt is a by-product in production of potassium fertilizers at the "BelarusKaliy" Company. The company iodizes salt depending on the needs of the domestic market.

In 2003 both enterprises produced about 65,000 tons of iodized salt and more than 50% was exported. Foreign market requirements influenced the commitment of top managers of the Belarusian salt-mining companies to implement the program of salt iodization. The main importers are Russia, Bulgaria and Hungary. Potassium iodate is supplied from Russia. In 2001, the two salt producers satisfied 75% of the country's needs; in 2003 this increased to 80%. Household testing suggested 55% of households use iodized table salt **(Table 1)**, while 82% of those surveyed declared the use of iodized salt.

According to the data of the Public Coordinating Council for Iodine Deficiency Prevention, at the Russian market, the price of iodized salt produced by the Belarusian companies is 2-4-fold lower than the price offered by the Russian producers. At the domestic market the retail price of the Belarusian iodized salt is 6-10% higher than the price of ordinary salt.

Iodization of food products

As Belarus has not adopted USI, the main method of ensuring iodine intake is its mandatory use in food production. The emphasis has been on the use of iodized salt in bread production. Bread is a traditional component of a daily diet of the majority of the Belarusian households. Its daily per capita consumption is about 200-300 grams. Therefore, the use of iodized salt in baking may provide 40-70% of the daily needs of an individual. This product was chosen due to the simplicity of baking technologies and the same recipes for the main varieties of bread.

Managers of a number of bread-baking plants were very cautious about the Government Resolution on mandatory salt iodization. In 2001 a number of complaints were forwarded to the Council of Ministers. Producers of bread and canned food were concerned that their products could become less tasty and could go up in price. Therefore, sanitary services conducted frequent inspections and at the same time made a special emphasis on advocacy work. Tests of iodine content in bread in different regions in 2003-2004 found an average of 25 ppm **(Figure 1)**. The estimated share of bread-baking plants that regularly use iodized salt is 90%. Resistance of producers was addressed through the traditionally high extent of government control in this sector, as the Government keeps bread prices under control.

It is also mandatory to use iodized salt in production of sausages, but most recipes do not require much salt (except for liver sausage and black pudding). Monitoring is conducted by the Republican Center for Hygiene, Epidemiology and Public Health, and by the Ministry of Trade. Production managers and technologists of meat processing factories in interviews by phone confirmed the use of iodized salt in production of sausages, smoked foods, and prepared foods. Senior officials from the Belarusian Research Institute for Technology in Meat and Dairy Industry confirmed that all the recipes for meat products included iodized salt. The Ukrainian-Belarusian preparation "iodis-concentrate" is used in production of some brands of bottled water, eggs and dairy products (iodcaseine is also used in production of sour-milk products). Unlike bread, the market segment of these products is narrower. This iodine concentrate is also used by one of the leaders of dairy indu-

A technologist at one of the Minsk-based bread-baking plants, when asked to describe his company's response to the Government resolution on mandatory iodized salt, responded as follows:
"We were not very enthusiastic about the Government Resolution. Our concern was that we would have to change recipes and the technological process as a whole. We were also concerned about a harsh increase of costs. As we are not allowed to raise bread prices, losses are inevitable."
"But we avoided changes of recipes and there were only minor cost increases. The cost of salt makes up only 3% in the total cost of the product and our company survived the cost increases fairly easily. We were also concerned whether iodine was still present in bread because the temperature of baking is 220 (F) degrees. Medical doctors assured us that it's OK. If this is so, we support the use of iodized salt in bakery products."

"We all have children, we all survived Chernobyl, and we realize the importance of iodization".

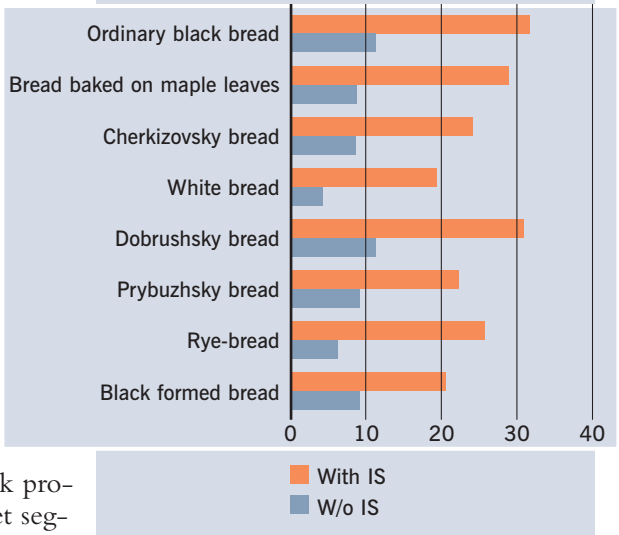

*Figure 1: **Iodine content (µg/100g) in different breads in Belarus baked with and without iodized salt***

stry – the Brest factory of dairy products, famous for its brand 'Savushkin Product'. Interviews by phone with cheese factories showed that none of them used iodized salt. The reason is a negative recommendation from the Belarusian Research Institute for Technology in Meat and Dairy Industry, based, on publications of the Russian Research Institute for Cheese and Butter Production. A common misperception is that iodization changes both taste and color of cheese.

Raising awareness about IDD

Due to cultural, historic and economic reasons, administrative control of iodized salt production in the country has proved to be fairly efficient. The Ministry of Health and UNICEF have done their best to encourage "MozyrSalt" and "BelarusKaliy" to implement the Government Program. Representatives of the two salt producers have been invited to participate in meetings with health sector and food industry professionals, and have received technical assistance. As a result, "MozyrSalt" now benefits from sales of iodized products in foreign countries.

An important task is to organize training for health professionals and school teachers. In the 1990s, in the wake of the Chernobyl accident, pediatricians and teachers were active advocates, and iodine was distributed in many schools, but efforts have waned somewhat since then. From discussions in focus-groups on food supplements and micronutrients, it is apparent that many rural health care practitioners rely on outdated information about the properties of iodized salt and the impact of IDD. To increase awareness, the UNICEF Office in Belarus has supported the production and distribution of information brochures and leaflets on IDD, with a circulation of >500,000 copies, and published articles in newspapers and in a magazine for primary school teachers. Dozens of training workshops involving hundreds of teachers from all regions of the country have been held.

It is not easy for a Belarus customer to get a clear understanding of the often conflicting advertising messages on products containing iodine and other micronutrients. One can see customers in shops trying to decipher labels on salt packages and other products. For example, the "Darida" company produces drinking water containing selenium, iodine and other elements. The "Mozyr Salt" company produces iodized, fluorinated and iodized-fluorinated salt. Some experts have expressed concern that availability of competing products at the market can discourage potential buyers of iodized salt.

A 2003 national survey including 5000 respondents reported 74% of the population was aware of the problem of iodine deficiency, and 87% of respondents had seen the advertising of iodized salt on TV. People with incomplete secondary education, living in rural areas, the elderly, and men were less informed about the problem. Rural people are particularly biased against iodized salt and

A key task for successful implementation of the IDD control program in Belarus is advocacy campaigns aimed at consumers. UNICEF has recently prepared a number of radio and video messages about the benefits of iodized salt. They are regularly shown on the national TV channel, and are targeted mainly at children and their families and convey positive messages. The most popular one includes a child saying "a pinch of salt is sufficient!", and has been shown since July 2001. This phrase was incorporated in the popular theatrical performance "A Kid and Karlson" based on a fairy tale by A. Lindgren, and in performances around the country children easily picked up the key phrase about "one pinch of salt". Semi-structured interviews have found that many adults have also learned about the benfits of iodized salt from the TV message "A pinch of salt is a way to health".

The power of this TV message is illustrated by a story from a Belarusian village. On Remembrance Day (the second Tuesday after Easter), people go to cemeteries to commemorate their ancestors. By tradition the requiem matins are held and people leave food on the graves as a symbolic meal for the deceased such as Easter eggs, Easter cakes, boiled rice with raisins and honey, and bread with salt. An elderly woman preparing such a traditional meal for the dead requested some salt to prepare the meal, and a chorus of voices responded to her with the phrase: "A pinch of iodized salt is sufficient!".

the majority of them prefer to use for cooking, and especially for pickling, non-iodized coarse rock salt imported from Ukraine. Changes of these habits should be a focus of the further communication campaign, but it may be difficult to address this problem without mandatory iodization of salt.

Table 1: Iodine content in table salt (%) in Belarus, by region and nationally, in 2003

Iodine ppm	Minsk	Minsk region	Brest	Gomel	Grodno	Vitebsk	Mogilev	Belarus
No iodine	50	50	46	39	32	45	51	45
1-14	21	28	19	21	13	17	12	19
15-25	29	20	36	40	56	37	38	36
26-40		2				1		0.4

Table 2: Household consumption of iodized salt by type of settlement (%)

Area of residence	No iodine	1-14 ppm	15-25 ppm	25-40 ppm
Capital city	50	21	29	
Big city	34	22	44	
Medium-size city	42	21	36	1
Small town	46	16	38	1
Rural areas	49	18	34	0.3
Total	**45**	**19**	**36**	**0.4**

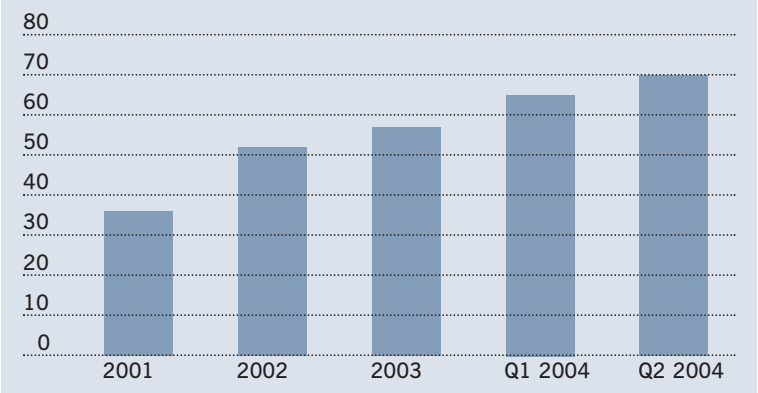

Figure 2: ***Share of iodized salt on the Belarusian market (%); Q=quarter***

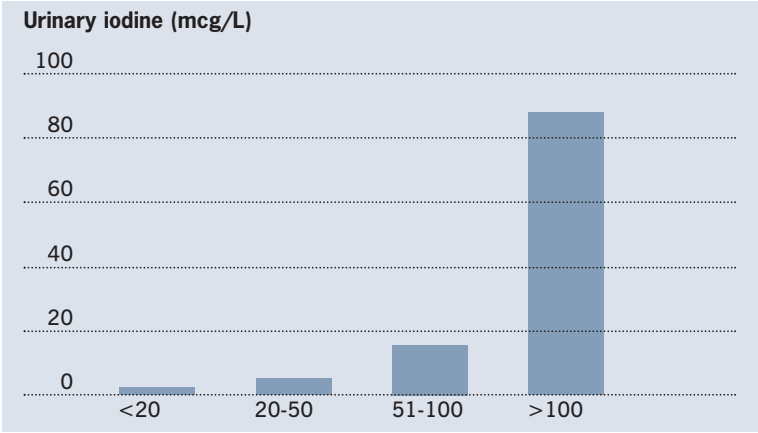

Figure 3: ***Urinary iodine excretion (%), in 9-17 y-old children in Belarus (n=282) in 2003, the overall median was 192 µg/L***

Current situation

Within the short period after the adoption of the National Program (2001), the Republic of Belarus has achieved a considerable progress in combating iodine deficiency. However, it appears that in order to eliminate IDD, USI may be necessary. In the third quarter of 2004 the share of iodized salt in retail network was 66,4%, and in the first quarter was 70%. This is nearly double the level compared to 2001 (36%). The best situation is reported in the capital city (up to 95%). However, in a number of rural areas the share of iodized salt available in retail network is 20%, mainly in border regions where non-iodized salt is supplied from Ukraine and Russia. Recently there has been a considerable slowdown in salt promotion at the market despite penalties and advocacy efforts.

Control measurements of iodine content in food offered by canteens and cafes in Minsk in 2002-2003 suggested that a standard lunch can provide 25-75% of the required daily dose of iodine. A survey of children and teenagers conducted in Minsk in 2002-2003 found a median UI was >180 µg/L, and normal thyroid function. Iodine was found in 75% of salt samples in the households of the surveyed children. A more recent study in Minsk by the Center for Hygiene, Epidemiology and Public Health found a median UI in school children of 210 µg/L. The current share of iodized salt available in Minsk in the retail network is estimated to be 55-57%.

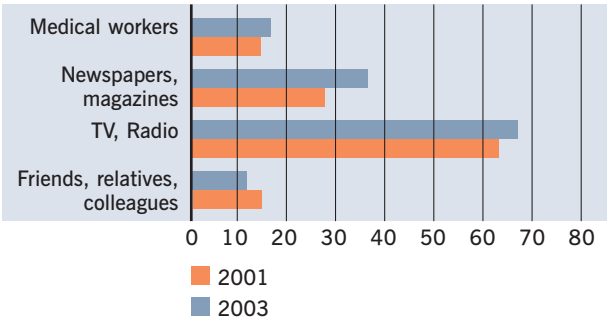

Figure 4: ***Information sources in Belarus on iodized salt, surveys 2001-2003 (%)***

Future perspectives

IDD experts now feel the next step needs to be mandatory iodization of salt, including the iodization of all table salt, as advocacy efforts have not been able to change the attitude of many rural populations. Attitudes of Belarusian government officials may change following the recent CIS agreement to promote iodized salt. At the end of 2003, the Belarusian Ministry of Health with support from UNICEF elaborated the strategy for elimination of IDD in 2004-2007. This year it is expected to draft and adopt the government resolution prohibiting import of non-iodized salt; by 2007 it is expected to ban the use of non-iodized salt in livestock sector. But many health sector top officials are still cautious about these measures. Resolutions have twice been rejected by the Ministry of Health, a stand likely influenced by resistance from the part of food producers, intensive promotion of organic compounds of iodine produced in Russia and the Government's interest to maintain good economic relations with Ukraine, which continues to supply non-iodized salt. However, if the government decides to only import iodized salt, the producer from Ukraine could meet this requirement. Further success of the program largely depends on effective lobbying at the Ministry.

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Meetings and announc

ICCIDD Board Meeting

The 2006 ICCIDD Board Meeting was held in New Delhi, India, on April 20-21. It was attended by: Jack Ling (Chair), Jerry Burrow (Vice-Chair), Basil Hetzel (Ex-emeritus Chair), Fereidoun Azizi, Harry Black, Hans Bürgi, Chen Zu-Pei, Dong Zhihua, Cres Eastman, Gregory Gerasimov, Richard Hanneman, David Haxton, Izzeldin Hussein, Pieter Jooste, Dan Lantum, Daniel Levac, Mu Li, Lorenzo Locatelli-Rossi, Venkatesh Mannar, Chandrakant Pandav, Eduardo Pretell, Aldo Pinchera, Claude Thilly, Paolo Vitti, Yan Yuqin, Michael Zimmerman, Judith Mutamba and Theo Ntambwe. David Haxton, Executive Director, emphasized that the recent nomination of 15 'priority countries' for IDD control by UNICEF, endorsed by the IDD Network Board, should focus ICCIDD attention on these countries; Regional Coordinators should cooperate closely with the relevant UNICEF offices in these countries. Daniel Levac, from the Treasurer's Office, reported that the annual expenses decreased from $687,325 in 2004 to $606,333 in 2005. Cres Eastman submitted a working document on the revision of the By-law, governance and operations of ICCIDD. The Nominations Committee proposed Gerry Burrow as new Chairman, Cres Eastman as new Vice-Chairman and Daniel Levac as Treasurer for a 3 year term. All these proposals were seconded and unanimously accepted. David Haxton's term as executive director was extended to 3 years. Jack Ling, as outgoing Chair, emphasized that ICCIDD's future focus should be in areas such as expansion of programmatic activities at country level, greater accountability, follow up to the WHA resolution, more regional collaborative meetings, broadening the funding base of ICCIDD, revision of the ICCIDD By-laws, promotion of greater participation of Directors and members, reaching out to other professional organizations, recruiting younger Directors, and launching an aggressive effort to form national coalitions.

ICCIDD attends the Arab League Meeting of Ministers of Health

David Haxton, Executive Director of ICCIDD, attended the Arab League Meeting of Ministers of Health at invitation of the Secretary General on March 13-19, 2006. Of the 23 Member States, 21 attended, 18 at the Ministerial level. Mr. Haxton presented a statement on IDD and prepared an extract of the Global IDD Data Base in Arabic. It pointed out that no AL Member has yet achieved coverage of 90% of households with adequately iodized salt, and few countries had formed national IDD coalitions. Part of the presentation was covered by Egyptian TV. Overall, the visit was meant to encourage the Arab League and Member States to renew the priority for USI and elimination of IDD.

Nune Mangasaryan: New Senior Advisor for Nutrition and Child Growth & Development, Nutrition Unit, UNICEF NY.

UNICEF recently announced the appointment of Dr. Nune Mangasaryan as a senior advisor for Nutrition and Child Growth & Development, in the Nutrition Section, of UNICEF New York (effective February 2006). Prior to this appointment, Dr Mangasaryan served as a Fortification Officer in the Nutrition Section and as a Nutrition officer in the CEE/CIS Region. Dr Mangasaryan trained as a public health physician and held several leadership positions in the Armenian Ministry of Health, including position of Deputy Minister of Health prior to joining UNICEF. Her contact information at the UNICEF Nutrition Section is + 1 212 326 71 59, E-mail: nmangasaryan@unicef.org

Moldovan food producers visit Switzerland to discuss iodized salt

On March 27-30, 2006, UNICEF invited delegates from the Republic of Moldova to visit Swiss food factories and learn from their experience of using iodized salt in food production. Among the delegates were government officials and major Moldovan food producers. In Gruyeres, cheese producers explained that using iodized salt in the famous Swiss cheese does not change the taste of it. The family company Baer, largest soft cheese producer in the country, stated that they have been using iodized salt as long as they can remember, without any negative effect on the quality. The delegation members themselves could verify this by tasting the many cheeses that are produced here. A tour at the Pouly Industrial Bread factory in Geneva once

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more convinced the delegation members that iodized salt use is, in fact, standard business practice in food production in Switzerland. "The visit convinced us that iodine has no effects on the taste and consistency of the food," said Ion Cretu, Head of the Department of the Food Industry and Regulations, Ministry of Agriculture and Food Industry of the Republic of Moldova. "We saw that all the famous products of Switzerland are produced with iodized salt. In Moldova, we have wasted a lot of time. We should have started using it a lot earlier!" It is hoped the visit will spur Moldovan food producers to start following the Swiss example of using iodized salt in processed food.

Rehabilitation of salt plants to accelerate salt iodization in Sri Lanka.

As part of the post-tsunami initiatives, the MI Asia just signed a memorandum of understanding with the government of Sri Lanka for a project amount of CAD 779,000. The project was initiated in collaboration with the local ICCIDD representative. During the project launching, the Healthcare and Nutrition Minister Nimal Siripala de Silva on Friday said that he was disappointed by the consumption of non-iodized salt by a large percentage of people in the country due to lack of understanding on the risk of brain damages and other related disorders. In an interview with the local newspaper, the Sunday Observer, Minister de Silva said that from the huge bulk of salt, currently produced by large and small scale salt manufacturers in Sri Lanka, only 30 per cent accurately maintains the accepted iodization standards. The Minister is also of the view that some salt manufacturers are in the habit of mixing colours in their manufactured salt and deceive consumers, saying that they are properly manufactured according to the accepted standards. Referring to a recently conducted program by the Health care and Nutrition Ministry in Colombo to provide assistance to countrywide salt producers to iodise the salt they manufacture, Minister Silva thanked ICCIDD and the MI (Asia) for granting a sum of Rs. 80 million to modernize the Hambantota and Puttalam salterns. It is reported that under this novel program, these two organizations are expected to provide technical assistance and the know-how to these two major salt manufacturers in order to produce at least 75,000 metric tons of iodized salt which is the national requirement of the country. Minister Silva further said that as the country was not self-sufficient in salt, around 10,000 metric tonnes were being imported from India annually and the health authorities had already been directed to make a thorough investigation into the iodization standards of such imported salt.

ICCIDD visit to Tanzania Food and Nutrition Centre Iodine Laboratory

The ICCIDD Regional Coordinator for Africa, Prof. D. Lantum recently assessed the urinary iodine laboratory of the Tanzania Food and Nutrition Centre (TFNC) as part of monitoring and evaluation of the national Universal Salt Iodization and Iodine Deficiency Disorders Programmes (USI/IDD). The findings of the assessment were: 1) TFNC has the necessary technical equipment and capacity to analyze 500-750 samples per day and therefore it can accelerate the urinary iodine assessment for the National Surveys; and 2) the urinary iodine assessed by TFNC meets international standards and it inter-calibrated with the CDC in Atlanta, U.S., and other world laboratories. Based on these findings, ICCIDD recommends that TFNC can be utilized by other countries in East, Central and Southern Africa Region for USI/IDD monitoring and reporting.

Second Regional Meeting of Salt Producers in Central Asia and Mongolia

Representatives from salt production companies and Salt Producer Associations of Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan and Uzbekistan, met in Tashkent, on November 22-24 to discuss progress and the remaining urgency to reach sustainable quality salt iodization in Central Asia and Mongolia. The meeting was organized by Asian Development Bank, United Nations Children Fund and Kazakhstan Academy of Nutrition as part of the Sustainable Food Fortification in Central Asia and Mongolia project. The participants of the meeting confirmed their support for the goal of universal salt iodization (USI) in order to protect newborns from brain damage and reduce national economic loss, and agreed on the following actions:

a. Upholding the principle that salt production companies are responsible for achieving USI by ensuring:

- ongoing improvements in quality iodized salt production
- promotion of iodized salt to the customers and the public
- un-interrupted adequate potassium iodate supplies, requesting UNICEF assistance where appropriate

b. Strengthen the authority of the Salt Producer Associations in their collaboration as full partner in national salt iodization programs in each country by:

- promoting membership by all salt production companies in the country
- membership of the Chairpersons in national Food Fortification Alliances
- engagement by the Associations as a full participant in the processes of regulation/legislation.

c. Strengthen the collaboration of Salt Producer Associations with the Governments and other national partners by:

- facilitation of cross-border trade and reduction of transport costs, tariffs and value-add taxes
- improving border control against illegal imports and exports of non-iodized salt
- continuous improvements of quality monitoring systems
- regular reporting to the Food Fortification Alliance about the status of iodized salt supplies
- submit proposals on how to improve the supply.

For more information about the project please visit: **http://caffproject.net/index.html.**

Abstracts

Aloumanis K, Mavroudis K, Vassiliou I, et al. Urgent thyroidectomy for acute airway obstruction caused by a goiter in a euthyroid pregnant woman. Thyroid. 2006;16(1):85-8

Pregnancy can contribute to thyroid enlargement. However, acute respiratory failure as a result of airway obstruction from an enlarged thyroid gland is an unusual incident. The case presented here concerns a 27-year-old woman in her 20th gestational week who underwent an urgent operation for removal of a nontoxic, multinodular goiter that was causing severe upper airway obstruction leading to acute life-threatening respiratory failure. Diagnosis of extrathoracic tracheal stenosis was based on spirometry with analysis of the flow volume curve and was confirmed by magnetic resonance imaging of the neck. Despite operational risks to the mother as well as the fetus during gestation, an urgent thyroidectomy was carried out successfully. The postoperative period progressed normally and the patient completed her pregnancy with no further respiratory symptoms.

Saggiorato E, Arecco F, Mussa A, et al. Goiter prevalence and urinary iodine status in urban and rural/mountain areas of Piedmont region. J Endocrinol Invest. 2006;29(1):67-73

Piedmont region was reported in the 1970s to be a mildly iodine-deficient area with a goiter prevalence > 10%. This study aimed at characterizing the current status of iodine deficiency in Piedmont, with special attention to differences between urban and rural/mountain areas. In a cross-sectional study, ultrasound thyroid volumes and urinary iodine concentration were measured in 2178 schoolchildren aged 11-15 yr, resident in Piedmont region for more than 5 yr, to assess both goiter prevalence and iodine intake. The median urinary iodine concentration was 116 µg/L and the prevalence of goiter was 3.1%, indicating this area is iodine-sufficient. No differences in goiter prevalence and median urinary iodine excretion were observed between urban and rural/ mountain populations. In conclusion, Piedmont is now an iodine-sufficient region.

Matalon S, Sheiner E, Levy A, et al. Relationship of treated maternal hypothyroidism and perinatal outcome. J Reprod Med. 2006;51(1): 59-63

The objective of the study was to investigate pregnancy outcome in women with hypothyroidism. A population-based study was performed comparing all singleton pregnancies of patients with and without hypothyroidism. Hypothyroidism was diagnosed and treated before pregnancy. Deliveries occurred between the years 1998 and 2002 in a tertiary medical center. During the study period 139,168 singleton deliveries occurred, and of those, 0.8% (n = 1,102) were in patients with hypothyroidism. The following risk factors were significantly associated with hypothyroidism: fertility treatments, recurrent abortions, diabetes mellitus, previous cesarean section and advanced maternal age. No significant differences regarding pregnancy complications, such as placental abruption, preterm deliveries or postpartum hemorrhage, were noted between the groups. However, patients with hypothyroidism had higher rates of cesarean deliveries (20.1% vs. 11.5%, $p < 0.001$). Perinatal outcomes, including birth weight < 2,500 g, Apgar score < 7 at 5 minutes and perinatal mortality did not differ between the groups. In conclusion, treated maternal hypothyroidism is not associated with adverse perinatal outcome. However, hypothyroidism is an independent risk factor for cesarean section.

Messina M, Redmond G. Effects of soy protein and soybean isoflavones on thyroid function in healthy adults and hypothyroid patients: a review of the relevant literature. Thyroid. 2006;16(3):249-58

Soy foods are a traditional staple of Asian diets but because of their purported health benefits they have become popular in recent years among non-Asians, especially postmenopausal women. One concern is that soy may adversely affect thyroid function and interfere with the absorption of synthetic thyroid hormone. In this review, 14 trials were identified in which the effect of soy foods or isoflavones on at least one measure of thyroid function was assessed in presumably healthy subjects. With only one exception, either no effects or only very modest changes were noted in these trials. Thus, collectively the findings provide little evidence that in euthyroid, iodine-replete individuals, soy foods, or isoflavones adversely affect thyroid function. Some evidence suggests that soy foods, by inhibiting absorption, may increase the dose of thyroid hormone required by hypothyroid patients. In addition, there remains a theoretical concern based on in vitro and animal data that in individuals with compromised thyroid function and/or whose iodine intake is marginal soy foods may increase risk of developing clinical hypothyroidism. Therefore, it is important for soy food consumers to make sure their intake of iodine is adequate.

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