Food industry – attack of salt on the consumer

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KARDIOVASKULARNO ZDRAVLJE – Prehrana i sol

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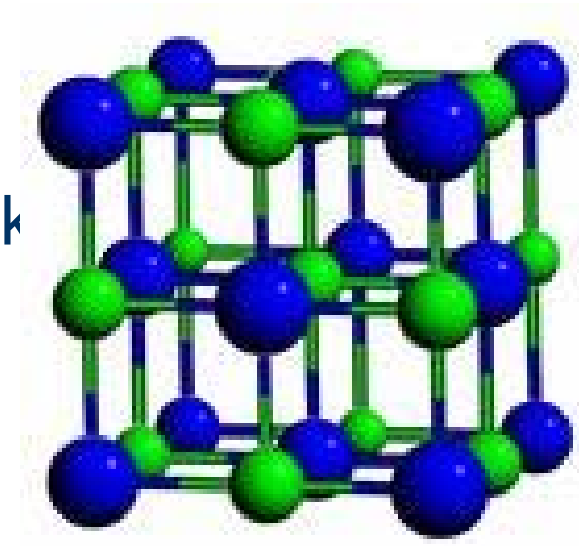
Salt/sodium chloride

- dietary mineral composed of 40% of sodium and 60% of chloride
- necessary for good health
- present in most foods we eat and drink



Sodium (Na+)

- essential for humans
- helps to regulate our fluid balance
- plays an important role in the transmission of nerve impulses

Form of salt

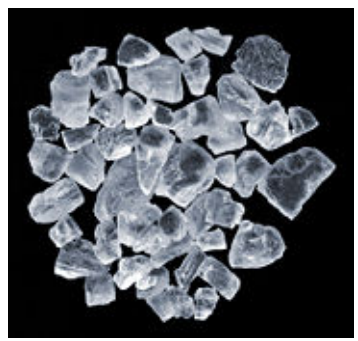
obtained from

- seawater (around 3%)
- mineral deposits (rock salt, or halite)

From a nutritional standpoint there is no difference in the salt produced from the two sources but there are differences in taste and texture

There are different forms of salt for human consumption

- unrefined salt (such as sea salt)
- refined salt (table salt) - which is most widely used presently, mainly sodium chloride
- iodized salt



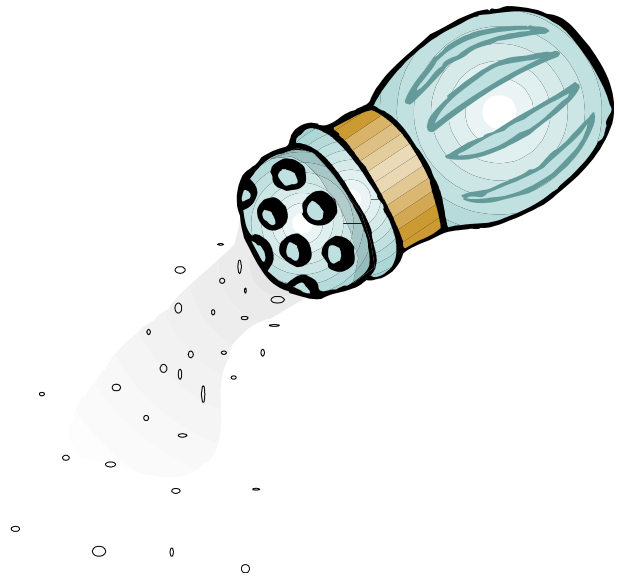
Sources of dietary sodium

- 75-80% from processing of food – manufacturing process and restaurants,
- 10% natural content of foods (eggs, meat, fish, vegetables, fruits) and
- 10-15% is added at the table and in cookin

Average European consumes 2 - 3 times salts/sodium more than should) 9 -12 g salts (3.6 - 4.8 g sodium)

Uses of salt

Salt is added to foods for different reasons:



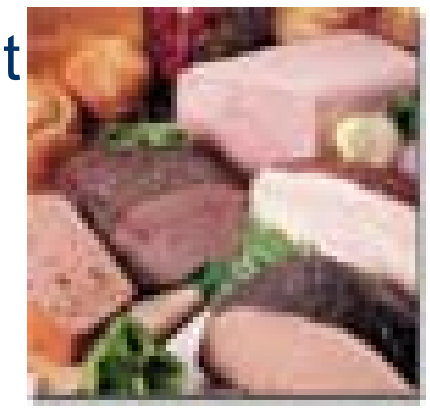
- to enhance the taste
- to preserve food,
- to improve texture
- as color developer
- as fermentation control of yeast

Salts in food industry

- besides NaCl, in different technological processes of preparing industrial meals, other kinds of salt are used:

  - sodium nitrite/nitrate
  - sodium glutamate
  - sodium carbonate
  - sodium proprinate
  - sodium lactate
  - sodium phosphate
  - sodium bicarbonate
  - sodium benzoate
  - sodium sulfite
  - sodium caseinate

- nitrite in meat products; particularly important in controlling *Clostridium botulinum*



Salt as a preservative

- salting - the oldest methods of food preservation, affects the development of microorganisms
- smoking and drying - used extensively in combination with salt, particularly for meat and fish products
- halophilic bacteria - able to live in media containing an elevated concentration of salt 15-20%
- salt and acid - preservation of vegetable product
- reduces water activity in food
- increase product shelf-life

Sources of sodium in the diet

Food sector	Na contribution %
• Cereals and cereals products (inc. bread, breakfast cereals, biscuits, cakes, pastries)	26-8 – 37.7
• Meat and meat products	20.5 -21.0
• Soup and souces	7.0 – 12.7
• Processed vegetables (inc. crips and snacks)	4.0 – 8.5
• Milk and cream	5.4 -8.5

Attack of salt on the consumer

Meat and meat products	Sodium range (mg/100g)	
• bacon	562 – 1840	2/3UL
• prosciutto - moderate salted	1600 – 2000	~UL
prosciutto - salted	3200 – 4000	>UL
• sausages	860 – 2240	
• ham, smoked	2700 – 2800	> UL
• different sauces	888 – 910	
• sauce of roast meat	468 – 8143 *	
• meat pies	200 – 1400	
• burgers	200 – 1200	
• meat soups	392 – 786	

Processed fish		
• smoked fish	500 – 1509	
• smoked codfish	7027	3UL
• low salted fish	500 – 4000	>UL
• high salted fish	4000 – 6000	>2½UL
• caviar	1500 – 2200	> UL

2300 mg/day sodum – upper limit recommended

Attack of salt on the consumer

Sort of cheese	Sodium range (mg/100 g)
Cottage Cheese	300 – 630
Brie	556
Camembert	605 – 790
Cheddar	620 – 723
Parmesan	756 – 1000 (½ UL)
Gouda	860 – 925
Gorgonzola	1220
Edamer	996 – 1050 (½ UL)
Ementaler	450
Danish Blue	1220 (>½ UL)
Feta	1440 (>½ UL)
Roquefort	1670 – 1750 (¾ UL)
Mozzarella	137
Creamy cheese	1250 (>½ UL)

2300 mg/day sodum – upper limit recommended

Attack of salt on the consumer

Baker products	Sodium range (mg/100 g)
• bread	380 – 725;
• rolls	300 – 590
• bread crumbs	760
Fast food	
• pizza, sandwiches	1500 – 2000 (UL)
• salted snacks	349 – 512
• chips	349 – 594
• hamburgers and hotdog	~ 1910
cereals	300 – 400
• cornflakes	1160 (>½ UL)
• yeast extract	50 – 170
• mayonnaise	700 – 800
• package soups	228 – 922
• canned vegetables	274 – 1353
• pickles	620
• marinated olives	2100 (DI)
• ketchup	950 – 1200 (>½ UL)

2300 mg/day sodum – upper limit recommended

Attack of salt on the consumer

Natural non-carbonated mineral waters	Sodium range mg/l
• Jana (Svetojanske toplice)	1.98 – 2.27
• Unique (Apatovačka kiselica)	7.65
• Bistra (Gatalovac)	2.60
• Jamnica Ivino vrelo (Jamnička kiselica)	168,34
• Sport (Jamnička kiselica)	161.70
• Kristina (Lipik)	1.5
• Studena (Lipik)	11.60
• Rial (Kozjak)	1.2

Carbonated mineral waters	
• Jamnica (Jamnička kiselica)	900.27
• Kapljica (Apatovečka kiselica)	604.70
• Bistra (Gotalovec)	2.60
• Studenac (Lipik)	123.1 – 650.0
• Radenska	
• Kiseljak	160.1
• Donat Mg (Rogaška slatina)	1500

Salt replacement

- Food industry needs to reduce salt content for a 55-60% in all food
- It can be achieved by:
  - lowering of added sodium chloride
  - partial replacement of NaCl by other chloride salts (KCl, $CaCl_2$, $MgCl_2$) 20-40 % is acceptable
  - partial replacement of NaCl by nonchloride salts as phosphates and
  - new process techniques or modification of technological processes

Salt replacement

Commercial mixtures of NaCl and KCl

- Pansalt®
  - half of the sodium is removed and replaced with KCl, $MgSO_4$ and the essential amino acid L-lysine hydrochloride
  - sodium is reduced 43%
  - relative saltiness compared to salt (NaCl) is 70%
  - problem with bitterness of potassium and magnesium
- Morton Lite Salt ®(mixture of NaCl:KCl in relation 60:40)
- AlsoSalt (KCl and L-lysine) processed in a way that bitterness is reduced
- Adsalt Lo (KCl-NaCl mixture where 13.6% K and 35%Na)
- Sub4salt (Na-glukonate+NaCl+KCl) - 25-50% reduce in sodium
- Lo ®Salt (66,6% KCl and 33.3% NaCl)
- Saxa So-low salt, Nalow

www.pansuola.fi, www.alsosalt.com/potassium1.html, www.mortonsalt.com/consumer/products/foodsalts/litesalt.html,


Thank you for your attention!