

Background

Nitrites are commonly used as food additives E 249 and E 250 in the production of meat products, mainly to protect them from the contamination of bacteria *Clostridium botulinum*. The nitrite intake should be limited because of their potential carcinogenicity in humans (IARC). The EFSA experts derived an ADI of 0.1 mg sodium nitrite/kg bw per day, corresponding to 0.07 mg nitrite ion/kg bw per day. Besides the meat products the other its sources are: cheese and fish products. The aim of this work was the assessment of nitrite intake (expressed as sodium nitrite) with the diet of Polish population.

Tab. 1. The daily sodium nitrite intake (mg/person/day) – total sample

| Age (years) | N | Mean | Median | P95 |
|---------------|------|------|--------|------|
| 1-3 | 118 | 0.94 | 0.26 | 4.47 |
| 4-10 | 455 | 1.07 | 0.53 | 4.34 |
| 11-17 | 581 | 1.72 | 1.13 | 5.56 |
| 18-74 (men) | 1278 | 3.06 | 2.18 | 9.42 |
| 18-74 (women) | 1578 | 1.29 | 0.75 | 4.72 |
| >74 (men) | 46 | 1.64 | 0.66 | 5.51 |
| >74 (women) | 78 | 1.19 | 0.87 | 4.67 |
| Total (1-96) | 4134 | 1.87 | 1.03 | 6.88 |

Tab. 3. The daily sodium nitrite intake (mg/person/day) - consumers only

| Age (years) | N | Mean | Median | P95 |
|---------------|------|------|--------|------|
| 1-3 | 78 | 1.43 | 0.88 | 4.47 |
| 4-10 | 342 | 1.42 | 0.81 | 4.86 |
| 11-17 | 488 | 2.05 | 1.43 | 5.71 |
| 18-74 (men) | 1077 | 3.63 | 2.68 | 9.78 |
| 18-74 (women) | 1156 | 1.76 | 1.16 | 5.21 |
| >74 (men) | 31 | 2.43 | 1.42 | 6.62 |
| >74 (women) | 60 | 1.55 | 1.17 | 4.71 |
| Total (1-96) | 3232 | 2.39 | 1.53 | 7.60 |

Material and methods

The data on sodium nitrite intake were based on the daily consumption of food products and dishes by the representative sample of Polish population (4134 persons) aged 1-96 studied in 2000 and the actual content of this substance in food products. These data were combined with on the basis of the chemical analyses by the State Sanitary Inspection. The risk assessment was based on the sodium nitrite intake calculations of: mean (X), median (Me), percentile 95 (P95) and its comparison to ADI. The data were analysed in the respect of the total studied sample and the group 'consumers only'. The statistical analyses with use of U-Mann-Whitney test were done.

Tab. 2. The % of ADI of sodium nitrite intake – total sample

| Age (years) | N* | Mean | Median | P95 |
|---------------|------|------|--------|-------|
| 1-3 | 110 | 66.9 | 17.4 | 286.8 |
| 4-10 | 451 | 41.9 | 19.8 | 168.1 |
| 11-17 | 572 | 34.5 | 21.5 | 112.1 |
| 18-74 (men) | 1247 | 39.5 | 27.0 | 119.9 |
| 18-74 (women) | 1543 | 19.9 | 11.1 | 71.5 |
| >74 (men) | 45 | 24.2 | 12.6 | 104.5 |
| >74 (women) | 73 | 19.1 | 14.0 | 66.6 |
| Total (1-96) | 4041 | 31.8 | 17.4 | 111.5 |

* persons with body weight measurements

Tab. 4. The % of ADI of sodium nitrite intake – consumers only

| Age (years) | N* | Mean | Median | P95 |
|---------------|------|-------|--------|-------|
| 1-3 | 73 | 100.8 | 55.2 | 311.3 |
| 4-10 | 338 | 55.9 | 32.9 | 183.3 |
| 11-17 | 480 | 41.1 | 27.3 | 118.3 |
| 18-74 (men) | 1053 | 46.8 | 34.2 | 125.7 |
| 18-74 (women) | 1126 | 27.3 | 18.0 | 80.4 |
| >74 (men) | 30 | 36.2 | 28.4 | 114.1 |
| >74 (women) | 57 | 24.5 | 17.7 | 68.1 |
| Total (1-96) | 3157 | 40.7 | 26.2 | 122.4 |

* persons with body weight measurements

Conclusions

The Polish population was characterized by the average intake of sodium nitrite at the safe level (below ADI).

However, there were observed some intake of sodium nitrite (P95 level) which exceed ADI. The most exposed group were children.

A balanced and varied diet, with limited consumption of meat and its products (up to 0.5 kg per week) will help to diminish the risk of excessive intake of nitrites in Poland.