

Opinion of the Scientific Panel on Dietetic Products, Nutrition and Allergies on a request from the Commission related to the Tolerable Upper Intake Level of Sodium

(Request N° EFSA-Q-2003-018)

(adopted on 21 April 2005)

SUMMARY

Sodium is an essential nutrient involved in fluid and electrolyte balance and is required for normal cellular function. Dietary deficiency of sodium is very uncommon due to the widespread occurrence of sodium in foods.

Sodium is present in foods as a normal constituent at a low level. It is also added to foods, mainly as sodium chloride (commonly known as salt) during processing, cooking and immediately prior to consumption, but also in other forms, for example as sodium nitrate, sodium phosphate or sodium glutamate. The main reasons for the addition of salt during the processing of foods are for flavour, texture and preservation.

Mean daily sodium intakes of populations in Europe range from about 3-5 g (about 8-11g salt) and are well in excess of dietary needs (about 1.5 g sodium/day in adults). The main source of sodium in the diet is from processed foods (about 70-75% of the total intake), with about 10-15% from naturally occurring sodium in unprocessed foods and about 10-15% from discretionary sodium added during cooking and at the table.

The major adverse effect of increased sodium intake is elevated blood pressure. Higher blood pressure is an acknowledged risk factor for ischaemic heart disease, stroke and renal disease which are major causes of morbidity and mortality in Europe. The effect of sodium on blood pressure is linked to that of chloride. For groups of individuals there is strong evidence of a dose dependent rise in blood pressure with increased consumption of sodium as sodium chloride. This is a continuous relationship which embraces the levels of sodium habitually consumed and it is not possible to determine a threshold level of habitual sodium consumption below which there is unlikely to be any adverse effect on blood pressure.

While blood pressure, on average, rises with increased sodium intake, there is well-recognised variation between individuals in the blood pressure response to changes in sodium chloride intake. Individuals with hypertension, diabetes, and chronic kidney disease, as well as older-age persons, tend to be more sensitive to the blood pressure raising effects of sodium intake. The blood pressure response to sodium can be modulated by a range of factors which include other components of the diet (e.g. potassium), relative body weight, and level of physical activity, as well as fixed factors which include age, gender and genetic factors.

Epidemiological studies indicate an association of increased risk of morbidity and mortality from cardiovascular diseases, including coronary heart disease and stroke, with increasing sodium intake. Evidence that high sodium intake may have a direct adverse effect on heart function, independent of any secondary effect due to changes in blood pressure, is not conclusive. Sodium is not carcinogenic but high intakes sodium chloride can increase the

susceptibility to the carcinogenic effects of carcinogens, such as nitrosamines, and gastric infection with *H. pylori*.

The panel concludes that the available data are not sufficient to establish an UL for sodium from dietary sources.

There is strong evidence that the current levels of sodium consumption in European countries contribute to increased blood pressure in the population, which in turn has been directly related to the development of cardiovascular disease and renal disease. For this reason, a number of national and international bodies have set targets for a reduction in the sodium consumed in the diet.