Health economical analysis of the potential reduction of salt, saturated fat and sugar in foods to lower the risk of nutrition related diseases in Germany

Karolin Sentfleben1,3, Katja Riedel2, Martin Langer2, Peter Deumelandt3 and Toni Meier1,3
1Martin-Luther-Universität Halle-Wittenberg, 2BRAIN AG, 3Privates Institut für Nachhaltige Landbewirtschaftung GmbH (INL)
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Objective
The international scientific community agree that a healthy nutrition lowers the risk to develop nutrition related diseases. Direct medical treatment costs of all diseases captured by the official Federal Health Monitoring in Germany rose nominally from 158 to 300 billion EUR between the years 1992 and 2012 (Destatis, 2014, Statistisches Bundesamt, https://www-genesis.destatis.de). Thus, lowering diet related diseases might also lead to a decrease of economic burden for the society. Subject of this study was the quantification of the economic burden of diet related diseases based on an unbalanced nutrition in Germany.

Procedure & Methods
• Systematic review and meta-analysis of studies correlating non-communicateable diseases (NCD) to excessive consumption
  - Sugar (MDS, monosaccharides and disaccharides)
  - Saturated fatty acids (SFA)
  - Salt
• Classification of the published papers into evidence classes according to DGE (2011).
• Calculation of population attributable risk (PAR, according to Spiegelmann et al., 2007) for correlation of health care costs to diet induced risk factors of NCD.

PAR = 1 - 1 / p(RR - 1) + 1

• Calculation of health care costs for treatment of NCD referring to healthcare expenditures in Germany and to international classification of diseases (ICD) (Destatis, 2014). Most recent data with a differentiation between different diseases from 2008 were used as reference.
• Analysis of stepwise reduction scenarios on medical treatment costs of NCD. A linear dependence endpoints (2012).
• Statistical effect sizes were validated by analyzing the 95% confidence interval (CI).

Results I
Tab. 1. Total and avoidable healthcare costs by means of a balanced intake of MDS, salt, SFA regarding considered diseases.

Results II
Fig. 1 Healthcare costs associated with an overconsumption of MDS, salt and SFA. The overconsumption of sugar imposes the highest burden with 8.6 billion EUR (CI95%: 3.0-12.1) – mainly due to treatment costs of diabetes mellitus, obesity, ischemic heart disease, chronic obstructive pulmonary disease and arthropathy (mainly mediated by overweight/obesity).

Conclusions
• Expectable direct healthcare savings concerning disease burden and medical treatment costs by means of a balanced intake of sugar, salt and saturated fat are substantial.
• Association of dietary factors (in particular an excessive intake of MDS, salt, SFA) and clinical endpoints with related treatment costs is evident (see Tab. 1 and Fig. 1).
• German healthcare costs correlated to an overconsumption of MDS, salt and SFA for solely direct medical treatment, were calculated to 16.8 billion EUR (see Fig. 2).
• An adequate intake of MDS, salt and SFA would lower yearly healthcare cost by 16.8 billion EUR, which is calculated to be 7% (CI95% 2%-10%) of the total medical treatment costs in the year 2008 (254 billion EUR) and could be used as an effective leverage to diminish the pressure on healthcare, health insurance and national tax levy systems.
• Actual societal and economical gains, may exceed the 16.8 billion EUR, as in this study solely direct medical treatment costs regarding an adequate intake were considered.
• Optimizing existing and/or development of new formulations or possibly by introducing new components with an enhanced nutritive performance will allow consumers access to healthier food and should be supported.
• Within the BMBF funded Strategic Alliance NatLIFE 2020, BRAIN AG develops a new generation of natural, biologically active ingredients for food industries to enable the reduction of dietary risk factors and the formulation of tasty and healthy food.

References