

number of children requiring attention for overweight due to the protective effect of breast-feeding. There would be less need for the diversion of foodstuffs through dairy animals to produce breast milk replacements, and less need for the use of materials and energy. Producers of animal products, food consumers decision makers in public catering are the critical stakeholders for minimizing climate change impacts of the food chain. From a household's point of view food chain constitutes one of the largest source of greenhouse gas emissions in the EU countries, together with mobility and residential energy use. The health sector is critical to the development of comprehensive approach to the mitigation of climate change-related aspects. The adaptation of the traditional

health and public health approaches to make them sensible to climate change is an issue worth attention. The responses in the area of food and nutrition in relation to climate change need to be developed, implemented and fine-tuned. The WHO policy framework based on the commitments of the European Charter to Counteract Obesity and the European Food and Nutrition Policy Action Plan 2007–2012 both highlight the importance of measures involving the food chain to prevent overweight and obesity. Some authors consider important these priorities in responses to the challenge posed by climate change and nutrition with a focus on children. WHO is developing specific projects on climate change and nutrition in some countries of the region.

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## Health and environmental benefits from combined control of obesity and climate changes

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**Introduction:** Modern lifestyle is one among the most relevant causes of obesity and climate change. Preventing both of them implies a win–win strategy for the improvement of social wellness (i.e. health and environmental benefits). A suitable strategy could be addressed to the partial substitution of caloric food (e.g. meat), which is also responsible for a large amount of greenhouse gas (GHG) emissions, with less caloric food (e.g. fruits and vegetables), which is proved of exerting a lower impact on climate change.

**Method:** The analysis is referred to the Italian case study, based on data from the Italian Statistical Institute. The relationship between obesity and climate change is here explained experimentally through a two-step model. In the first step, a regression model (Ordinary Least Squares method) is adopted to explain obesity rate in terms of ratio of people consuming meat more than once a week, and the ratio of people consuming fruits and vegetables less than once a day. The outcome of this analysis allows defining a policy target in terms of obesity abatement, provided by a reasonable change in food demand. In the second step, the observed change in food demand from the previous step is combined with Life Cycle Analysis indicators, retrieved from the scientific literature, referred to each type of food (i.e. meat, fruits and vegetables) in order to evaluate the impact of food industry on climate change.

**Results:** The Italian population shows alerting diet habits, with about 70% of people consuming meat at least once a week (first group), implying an excess of energy intake. In addition, about 56% of people are not used to eat fruits and vegetables at least once a day (second group). Assuming a policy aimed at cutting by half the ratio of both groups, by using the first model we estimated a reduction of the obesity rate from the current 9.68% to 7.04%. This implies an increase in the annual consumption of fruits and vegetables by 1 668 000 t, and a reduction of 873 360 t of meat. By using the second model, we estimated a significant reduction of CO<sub>2</sub> emissions (used as a proxy of GHG), by 5 406 000 t per year. In economic terms, the effect of the policy can be roughly estimated as 26.7 MEur of benefits for reducing the expenditure in obesity prevention, and 85.58 MEur of gain due to the reduction in carbon emissions.

**Conclusions:** The study shows the evidence that the consumption of food with low content of energy has a twofold effect in the reduction of obesity and in the mitigation of climate change. The approach developed in the present study highlights the opportunity to design several measures within climate change policies targeted at the promotion of healthier and more environmentally oriented diets. However, there is still room for discussion on the design of effective and efficient strategies for a new dietary behaviour.