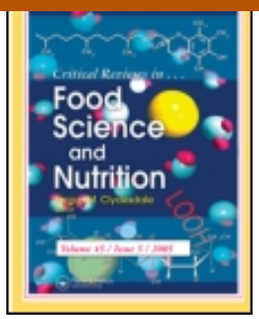

Critical Reviews in Food Science and Nutrition

ISSN: 1040-8398 (Print) 1549-7852 (Online) Journal homepage: http://www.tandfonline.com/loi/bfsn20

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To cite this article: Giovanni Fattore & Carlo Agostoni (2016) Health, Wellbeing and Social Sciences, Critical Reviews in Food Science and Nutrition, 56:12, 1960-1963, DOI: 10.1080/10408398.2015.1018041

To link to this article: http://dx.doi.org/10.1080/10408398.2015.1018041

Accepted author version posted online: 18 Mar 2015.
Published online: 18 Mar 2015.

Critical Reviews in Food Science and Nutrition, 56:1960–1963 (2016)

ISSN: 1040-8398 / 1549-7852 online
DOI: 10.1080/10408398.2015.1018041

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Health, Wellbeing and Social Sciences

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For social interventions aimed at improving nutrition behavior evidence from randomized trials is essential but cannot be the only approach of research activities. Interventions on dietary habits require considerations on food security, economic and environmental sustainability, and a broad meaning of wellbeing which includes, but also goes beyond, health effects. The model of research in nutrition requires a new consideration of observational studies, mainly through different analytical models. Nutrition and food studies need research programs where medical (nutrition and health), psychology (how we behave), economics (how resources are used and their impact on wellbeing) and sociology (how social determinant shape behavior) collaborate.

Keywords Dietary interventions, nutritional studies, nutrition economics, food sustainability, social sciences in nutrition

INTRODUCTION

Diets high in animal fats and low in unsaturated fats have been associated an increased risk of coronary heart disease (CHD) and cardiovascular diseases (CVD) in animal and human studies (Kato et al., 1973; Grundy et al., 1982; Keys et al., 1984; Keys et al., 1986). In the last few decades, recommendations to substitute animal fats rich in saturated fatty acids (SFA) with polyunsaturated fatty acids (PUFA), have been the main focus of several dietary guidelines targeted to reduce CHD and CVD morbidity and mortality (Aranceta and Perez Rodrigo, 2012). The main reason for that advice was the raising effect of dietary SFA on blood total cholesterol (TC) and low density lipoprotein cholesterol (LDL C), which are known risk factors for CHD and CVD) : However, not all studies had supported the relation between SFA and CHD or CVD (Kushi et al., 1985; Ascherio et al., 1996; Gillman et al., 1997; Mozaffarian et al., 2004; Siri Tarino et al., 2010) and conflicting results recently emerged on the benefit of substituting SFA with PUFA on major cardiovascular outcomes (Mozaffarian et al., 2010; Ramsden et al., 2013; Rizos et al., 2013). In addition, over the last years a more complex picture concerning risk factors for CVD came out. Beyond the traditional serum/plasma markers of CHD risk, i.e., TC, LDL C, high-density lipoprotein cholesterol (HDL C), and triacylglycerols (TAG), other biomarkers as apolipoprotein (Apo) AI, and B, the main protein components of HDL C and LDL C, respectively, and lipoprotein a (Lp(a), have been suggested to be valid, if not better, risk predictors (Kronenberg et al., 1999; Walldius et al., 2001; Blaha et al., 2008; McQueen et al., 2008).

Recommending the substitution of SFA with PUFA requires more scientific evidence on a qualitative, and not just quantitative, standpoint. Better evidence about dietary risk factors does not fulfill the requirements for the use of research for policy making. While it is widely accepted that nutrition may health status and wellbeing, the gap between research and policy making appears very wide. Policy makers would need scientific evidence to motivate action and legitimize choices in arenas that are often crowded by several conflicting stakeholders and fanatical opinions (Ioannidis, 2013). Unfortunately available evidence on costs and benefits of specific interventions is often lacking or at least inadequate (Gyles et al., 2012). We will here try to suggests possible reasons of this gap and offer some suggestion for future directions.

The Value and Limits of the Medical Model of Nutrition Interventions

The scientific model generally followed by nutrition research is strongly influenced by medical paradigms and, more recently, by the broad acceptance of the evidence-based

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medicine model. Robust evidence, typically based on randomized trials, provides the most valuable proof of the impact of specific interventions on human health. This model, well established worldwide, is typically focused on the evaluation of specific interventions investigated in rather manipulated environments to guarantee the constancy of other factors and thus reduce the risk of confounding.

This model is being increasingly appreciated and used by social scientists who are keen to improve the rigour of the evidence that randomized experiments can produce, both in the field (Duflo, 2008; Kremer and Glennester, 2012) and in the lab (Murray et al., 2004; Falk and Heckman, 2009). However, in many areas of social sciences the value of experiments is still debated for at least two major reasons. The first concerns the feasibility of unbundling social action. Often, if not always, social policies entail a variety of interconnected interventions that cannot be disentangled into specific components amenable to experiments. This is often due to the nature of social actions where more interventions are concurrently designed and implemented to deal with problems, but it is also due to the nature of policy processes favoring solutions where multiple interventions are adopted (e.g., in order to get sufficient political support). While the registration of pharmaceuticals is based on specific documentation produced for each compound and for specific indications, social interventions are not subjected to this regulatory framework (see below).

The other reason is the limits of external validity of proofs of social interventions. While the issue of whether results of randomized trials are generalizable is indeed serious even in medicine, when interventions strongly interact with social and economic conditions, which greatly vary in space and time, the issue of external validity (or generalizability) becomes of paramount importance. Let's take for example diet studies; how can results from southern Europe be applicable to Asian populations, given the radically different cultural, social and natural contexts?

For social interventions, the introduction of a new tax or the labeling of products, randomized trials can be very beneficial but cannot be the only focus of research activities. It is a problem of feasibility and costs. Randomized trials may be technically unfeasible, for example, because it would be impossible to randomize people to different taxation regimes, or they may be politically unfeasible because randomization, by differentiating individuals, creates formidable obstacles to the policy process that, in democratic regimes, need popular support for collective action. Probably, cluster randomized studies may be more feasible and indeed, as the experience of experiments in developing countries show, may be used as a major research design to provide inputs to policy making (Kremer et al., 2012). However, despite the potential of field experiments, it is unrealistic to assume that evidence for policy making can mainly derive from randomized experiments due to these feasibility issues. The other problems with randomized trials concerns costs. The medical model is hardly replicable in the field of nutrition because of the extreme difficulty to fund studies that are very costly. In simple terms, in social sciences there is not the business model of the pharmaceutical sector, where huge and risky investments are rewarded by the extra-profits of eventual monopoly (although temporary) granted by patents. In sum, while more randomized trials are surely extremely useful to better understand the health effects of specific diet changes and some nutrition interventions, other research designs are needed to produce evidence on the overall impact of social interventions (Ioannidis, 2013).

A Call for Interdisciplinary Action

Interventions aimed at changing our diets, although based on sound scientific evidence on physiology and pathology, should fully consider that eating and drinking behaviors are deeply embedded in social, economic and cultural contexts and that interventions tend to be nonmedical in nature. In addition, our societies strongly endorse basic liberal principles that limit the space of strong restrictions (e.g., banning categories of food) and subject decisions to approval of democratic institutions. This is not a minor issue and is often neglected by the scientific community. While in Europe and the United States, democratic institutions have given the mandate to technocratic bodies, namely EMA and FDA, to regulate the access to pharmaceutical compounds on the basis of safety and efficacy, food and nutrition policies are likely to remain in the direct domain of policy making and subjected to direct democratic accountability. Here it is important to appreciate the difference between a drug and, for example, a natural product like palm oil. Collective interventions on the former requires market authorization aimed at guaranteeing the safety, effectiveness and quality of the production process for the introduction of a new product. This authorization is expected to be based on scientific evidence mainly produced by the marketing company with tests investigating the overall effects of the drug. Importantly, the drug is a medical intervention whose administration is justifiable only because of its health improvement effects. Palm oil, instead, is a product that individuals eat in a variety of possible meals, is part of cousin traditions in many continents, with major differences across the globe, partly due to the conditions of the local natural environment. Most importantly, it is not used with a medical purpose but in a set of daily activities that include preparing meal and eating, with all their meaning and rituals, and meet a demand for food as source of energy and personal pleasure. The main implication of these major differences is that the type of scientific evidence to offer guidance to policymakers can hardly be the same. Instead, the medical model tends to dominate the investigation of interventions that concern eating. While this approach to research is essential to produce knowledge on the effects of diets on health so that better and larger trials are urgently needed (Ioannidis, 2013), how to change nutrition habits need to be addressed through a full understanding of the psychological and social conditions of nutrition behaviors.

The Contribution of the Social Sciences

A number of disciplines, with their theories and empirical methods, can contribute to make a new agenda on nutrition and food policies. We are here listing some of the research trajectories appearing more fruitful. A major area of research is natural experiments. Events outside the control of researchers, as changes in food prices, new taxation regimens, regulations about labeling, just to mention a few, produce the possibility to identify interventions and counterfactuals that can be used to estimates the effects of interventions. These studies use changes in policies or other events to generate evidence about the effects of interventions and actions. Clearly, these studies cannot rely on randomization and thus create a number of problems in order to disentangle the effects attributable to interventions. Nevertheless, recent methodological advancements in the field of policy evaluation have produced statistical techniques to improve the internal validity of these studies and, in addition, the natural setting of these studies favor their generalization. These methods include the use of double difference models, propensity score matching and discontinuity regression (Khandaker et al., 2010). While most of these studies take advantage of natural situations where it is possible to identify counterfactuals, a simple, better dialogue between the research community and policymakers can help to produce evidence along the implementation process of policies. The basic idea is that policies that are robustly evaluated through pilot studies, testing, gradual introduction and good monitoring may create actionable scientific knowledge and favor the use of evidence in the policy making process. The area of social lab experiments is also promising and complementary to field experiments. Social lab studies, from those based on games to the use of neuroimaging, can shed light on how people behave and their motivations. Lab experiments are very flexible and may be easily combined with medical research. While historically they were mainly restricted to psychology, now they are widely conducted in several fields of the social sciences, including economics and political sciences.

Another strategy concerns a research agenda that fully recognize the complexity of food and nutrition and the consequent need of interdisciplinary teams and approaches. Experiments and quasi-experiments are very empirical in nature and often miss understanding the underlying mechanisms of action. Especially when the goal of action is to modify behavior it appears essential to understand better how people behave and respond to stimuli. One of the main merit of economics is to have produced theories about human behavior and to have tested them empirically. While these theories traditionally rely on strong assumptions about the rationality of behaviors, more recent contributions, mainly stemming from the interaction between economics and psychology, have shown how people may systematically break rational logc (Kahneman, 2011) and how public policies may leverage these behaviors to improve wellbeing (Oliver, 2013). For example, in order to reduce salt consumption, a strategy tested in England was to give five-hole salt shakers to replace the 17-hole type routinely used (Shroder and Lyon, 2013).

Nutrition and food studies need research programs where medical (nutrition and health), psychology (how we behave), economics (how resources are used and their impact on well-being), and sociology (how social contexts are shaped and shape individual behavior) work together. Preliminary examples come from investigations conducted in early nutrition (Taveras et al., 2004).

Biomedical sciences are probably the starting point because health concerns represent the focal justifications of policy interventions. Specific inputs on the value of nutrients and diets are on the other hand the bases for any action aimed at changing nutrition behaviors. Within this context, food production, economic well-being and human growth should be connected in a virtuous circle, hopefully. Then, the contribution of psychology is fundamental to understand how and why people behave and, more importantly, what types of interventions may favor desirable behavioral changes. Sociology is asked to put behavior in the social context as culture, social stratification and ties, just to mention some of the main areas of sociological research, interacts with individual behaviors. Finally, economics is asked to deal with the issue of finite resources and their efficient allocation to foster growth and, more importantly, social developments. The major contribution of economic studies probably concerns cost-benefit analysis (lato sensu) of interventions, and today one of the main economic challenges is to combine a variety of sub fields, including health, agriculture, environment and trade, all vital to the preservation of life.

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