

variously argued, for instance, that obesity prevention efforts should focus on calories [10], fats and sugars [11], refined carbohydrates [12,13] or on industrial processing in and of itself [5,14–16]. If the food industry is to be pushed, by regulation or public pressure, into developing healthier products, the development of clear parameters by which their products will be judged should become a priority of the research community.

There is one sense in which reforming the food industry will be easier than the fight over tobacco. Although years of mandatory health warnings proved to be largely ineffective for tobacco, the same is not likely to be true for food products—as long as ‘healthy’ does not become synonymous with ‘unpalatable’. Consumers have a long history of gravitating towards healthy foods when quality has been easily discernable [5], and taxes or subsidies (which would probably be ineffective anyway [17,18]) are unlikely to be necessary.

That the food industry uses modern technology to enhance sales is unsurprising. It is tempting to hope that restricting some of their more egregious practices will improve public health, and perhaps it would; but real change will come only when the public health community develops a clear vision of what efficiently produced healthy foods might look like.

Declaration of interest

None.

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IMPORTANT NEXT STEPS IN EVALUATING FOOD'S ADDICTIVE POTENTIAL

These commentaries highlight important issues about the potentially addictive nature of foods. Although further evidence for the validity of food's addictive potential were discussed, including neurobiological and behavioral indicators of addiction in animal models [1], behavioral markers of addiction in eating disorders [2], shared neuroendocrine responses in the consumption of foods and drugs [3] and similar *in utero* influences of addictive drugs and processed foods [4], concerns were also raised. Blundell & Finlayson suggest [5] that although factors associated with food addiction (such as implicit wanting) may be useful, the concept of food addiction may increase confusion surrounding obesity. We suggest that implicit wanting is an example of a common behavioral mechanism and represents part of a repertoire of behavioral elements underlying food addiction. If an addictive descriptor for foods is supported empirically, novel legal, educational and policy

approaches to creating a healthier food environment may warrant stronger consideration. Such approaches could help to better educate, inform and protect consumers.

Concerns were raised that food addiction may only be relevant to eating disorders because the general public does not appear to expend excessive energy in their consumption of palatable foods [5], and obesity is associated typically with only a modest increase in food consumption, a pattern seemingly different from drug use in addictions [2]. However, some addictions (e.g. tobacco-related) involve low-to-moderate intake of easily accessible substances that over time have deleterious consequences. Importantly, the addictive properties of some foods probably apply to a great many people—that is, not only to those with ‘clinical’ levels of obesity and/or disordered eating. As such, foods may contribute to poor diets and poor health associated with nutritional deficiencies. Indeed, obesity and malnutrition frequently co-occur. Thus, from a public health viewpoint, we believe that the combination of an addictive substance with easy accessibility represents a dangerous public health combination, as seen with tobacco and alcohol. Further, these factors may make the likelihood of excess consumption and subclinical problems especially widespread. For example, a relatively small percentage of the public consumes alcohol in an addictive manner [6], but the rewarding nature, widespread availability and social acceptance of alcohol may increase the subclinical impact of alcohol-related consequences [7].

The commentaries also highlighted important future directions. Authors emphasized the importance of identifying which ingredients in foods may be addictive [1–4]. Whether specific macronutrients (e.g. fat, sugar), food additives (e.g. salt, high-fructose corn syrup) or food characteristics (e.g. palatability, calorie content), or combinations thereof (e.g. caffeine and sugar), influence the potentially addictive nature of certain foods is an important empirical question. Such questions may have important developmental implications for foods as with drugs [e.g. flavored cigarettes (bidis) and adolescent smoking] [8]. The food addiction concept will have limited impact on public health on policy or industrial food reformulation unless there is a scientifically informed answer to this question. In summary, the growing evidence that certain foods may be capable of triggering an addictive process suggests that applying lessons learned in reducing the impact of addictive substances may advance public health strategies addressing obesity.

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