Author's response to reviews

Title: Addressing overweight and obesity: a review of the biological models underpinning recent public health interventions

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Version: 4 Date: 24 September 2012

Author's response to reviews: see over
Dear Sir/Madam,

Resubmission:

MS: 1534855919752955 Addressing overweight and obesity: a review of the biological models underpinning recent public health interventions

Thank you for inviting us to resubmit the manuscript following the initial review. As requested by the editorial board, the revised manuscript has been reformatted as an Opinion Piece.

We would like to thank the reviewers for their helpful, detailed and comprehensive comments. In response to these comments we have made significant changes to the paper and we feel this has substantially improved its quality, clarity and balance.

In addition to this covering letter, documentation of the response to reviewer and editor comments is included below. Also attached is a word document containing the changes to the original manuscript. Changes to the text are in red.

We hope this paper is received with interest, and thank you for your consideration.

Yours sincerely,

Katherine Hafekost
Response to TS

Expand on how our current understanding of body weight and energy balance regulation in terms of the quantitative aspects as thoroughly explored Hall et al.

An additional paragraph (page 9, paragraph 2) has been added to discuss the current understanding of the quantitative aspects of weight regulation as outlined by Hall and colleagues.

Reference to a popularized single paper in Scientific American in 2007 should be replaced by genuine scientific reviews and important original papers

The original quote was replaced with a reference from papers published in a peer reviewed journal (page 9, paragraph 1):

‘Body weight is centrally regulated with peripheral hormonal signals released from the gastrointestinal tract, pancreas and adipose tissue integrated primarily in the hypothalamus to regulate food intake and energy expenditure’


Expand on proposals about how research on treatment and prevention of obesity could be improved by adopting the knowledge about our current understanding of obesity, its causes as well as its effects on the regulatory systems of the body weight and energy balance.

Text was updated (page 15, paragraph 2) to expand on how future research in the field could adopt a multi-disciplinary approach which recognizes the impact of the regulatory systems on body weight control.

Proposals include:

- Ensuring that grant and funding panels considering future intervention research include those trained in the basic sciences in addition to public health advocates in order to promote the development of more appropriate research designs.
Shifting focus away from the existing dietary guidelines, which formed the basis of interventions in a number of the identified studies, to test dietary and exercise protocols which are biologically plausible and have been identified as beneficial to weight loss and maintenance.

- The development of large scale, long-term prospective studies to determine the optimal diet and exercise protocols for weight loss, maintenance and health.

Make a clear distinction between the studies testing the weight loss as such over shorter periods of time from studies that assess the long term effects, which also implies the abilities of the program to maintain the lower body weight.

Table 1 has now been split into short term (6 months or less) and long term interventions (greater than 6 months).

Make a distinction between effects on life style presumed to be of importance to later development of obesity and the actual development of obesity.

We aimed to select studies whose outcomes related to change in weight. We recognize the large literature which examines lifestyle based measures with the presumption that changing activity or consumption will affect future weight gain.

In order to address the reviewer’s comment, we have included the outcome measures for each study in Table 1 to allow readers to more easily identify studies which primarily focused on weight loss and those which incorporated process measures which were assumed to impact on obesity.

It would be of great interest to know if any of the reviewed papers did in fact consider going beyond the simple interpretation of the energy balance equation and how this influenced their justification of the study or the interpretation of the results. This aspect deserves a separate table or a decent expansion of the current table 1.

We extended Table 1 to include a description of which model of energy balance appeared to underpin each intervention. We also included any specific variations the authors included around...
this.

**Replace reference with a recently published meta-analysis: Harrington M, et al.**

Original reference replaced with suggested reference (page 12, paragraph 1)


In view of the controversy of the observations of increased mortality by weight loss, even intended weight loss, it may be considered to add arguments why this may happen.

While we recognize that the arguments relating to the relationship between intentional weight loss and mortality are of interest, we felt that this was beyond the scope of the current manuscript. Therefore, we included the review by Harrington et al, as mentioned above, but didn’t include further discussion of the association between weight loss and mortality.

**Response to RF**

The solution called for is “multidisciplinary approach in the design of future weight loss interventions” but it had little specific to offer and cites only one reference, an opinion article that urges untried and poorly conceived programs for taxation and other aversive government methods.

As outlined above, potential methods for multidisciplinary collaboration have been expanded in the discussion (Page 15, paragraph 2)

While the authors point out that “the unique metabolic and hormonal effects of chronic and high consumption of refined carbohydrates, and in particular fructose and sugar sweetened beverages, has been linked with low satiation, poor appetite control and a lack of compensation for calories consumed over the short and long term” they do not discuss those
metabolic effects and, as in much of the literature, are confusing appetite with metabolic, that is cellular control.

Text was updated (page 10, paragraph 2) to include:

The unique metabolic and hormonal effects of chronic and high consumption of carbohydrates, and in particular refined carbohydrates, fructose and sugar sweetened beverages, have been linked with low satiation, poor appetite control and a lack of compensation for calories consumed over the short and long-term.

In the area of public health, the authors cite the USDA guidelines but do not cite the critique of the guidelines which specifically says that consideration of dietary carbohydrate restriction would offer the public strategies beyond “decrease the calories they consume and increase the calories they expend through physical activity.”

Text updated to reference Hite et al.’s critique of the Dietary Guidelines for American’s (page 11, paragraph 1 and page 13, paragraph 2)

The benefits of the inclusion of diets, such as carbohydrate restricted diets, which are based on a complex model of energy balance was included (page 11, paragraph 1):

Additional references in this discussion include:

- Volek JS, Feinman RD: Carbohydrate restriction improves the features of Metabolic Syndrome. Metabolic Syndrome may be defined by the response to carbohydrate restriction. Nutr Metab (Lond) 2005, 2:31.
The discussion of the cited studies describes the methods but do not discuss the results beyond “statistically significant short-term weight and/or fat losses were achieved in many of the studies, weight change was often small and weight regain was evident in a number of studies. This finding is supported by an existing literature which suggests that early weight loss is often regained over the long term….” The first statement needs more discussion -- some of the studies look like they were successful -- calories in-calories out is not completely useless idea.

While some of the studies were successful, at least in the short-term, we suggest that based on existing literature these losses are unlikely to be maintained. In recognition of the reviewer’s concerns we included additional references and reworded the text (page 8, paragraph 1):
This finding suggests that, while restriction of energy intake and increased physical activity energy expenditure can achieve short-term weight loss, it does not provide a successful long-term treatment of excess weight as many people regain lost weight as the body adapts to new levels of energy intake and expenditure.

The second statement needs documentation. It is widely said that people regain the weight but anecdotally, generally not all: a net loss has to be considered good and the literature is weak on this data.

Text updated (page 8, paragraph 1) to include:

While any net weight loss achieved by interventions could be considered positive, it is currently unclear whether short-term loss and subsequent weight gain is beneficial or detrimental to long-term health. Maximizing an individual’s ability to lose and maintain weight should be the aim of any weight loss intervention.

In summary, the details of the results of the tabulated data need to be discussed and the authors need to address the major alternative to the “calorie is a calorie” principle that they are critical of, namely dietary carbohydrate restriction. If they do not see this as a benefit, they can explain why but they cannot simply ignore this whole side of the literature.

We appreciate the reviewer supports the low carbohydrate approach and we recognize that there are a range of views around this in the literature (for example, need to restrict consumption of high glycemic carbohydrates, refined carbohydrates, fructose and/or all carbohydrates). We aimed to reflect the diversity of opinions in the manuscript. We feel it would be a significant step forward if public health interventions adopted any of these approaches. The study of interventions based on a more accurate understanding of homeostatic mechanisms should quickly lead to improved understanding of which type of diets work best and for whom.

As mentioned above, discussion of the potential use of carbohydrate restricted diets in intervention research was added (page 11, paragraph 1).

Response to Editor
In your manuscript, it would also be interesting to add some discussion about whether it is unethical and a waste of time to try and prevent obesity on the basis of the energy balance equation, in light of the information you have presented about the complexity of the pathways involved.

While public health interventions which result in improved diet and positive changes in physical activity may be associated with health benefits, we believe that continuing to promote such interventions as a treatment for overweight and obesity is unproductive and a waste of resources that could be better used to investigate more plausible alternatives. We have updated the discussion to reflect these views (page 13, paragraph 3).