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Opinion Paper

The greater calorie deficit applied to the bodybuilding athlete, the greater their loss of fat-free mass on the stage presentation?

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SUMMARY

Background & Aims: The total preparation for a bodybuilding competition basically involves two phases, the preparation phase, and the pre-competition phase, in which both tend to add up on average 32 weeks. During the pre-contest phase, bodybuilding athletes maintain a negative energy balance both by lower energy intake from the diet and by the longer time dedicated to training, to try reducing the body fat percentage, fat-free mass (FFM) maintenance and to present a dense and dry physique on stage in the competition day. Therefore, this work tries to bring a correlation explanation between a greater caloric deficit applied to the bodybuilding athlete during his preparation with the variation in fat free mass between the preparation and pre-contest phases. This way, open the question: "could greater caloric deficits in the bodybuilding athlete's dietary intake be closely correlated with negative changes in fat-free mass for stage performance?"
Methods: The author searched PubMed and ScienceDirect databases for recent studies involving the food consumption of bodybuilders when preparing for competition using the keywords "bodybuilding", "diet" and "preparation". 16 results were obtained from ScienceDirect and 8 from PubMed. Two cross-sectional studies and two case studies involved the evaluation of the food consumption of forty-four male athletes practicing bodybuilding over eighteen years of age during their preparation that lasted from 5 to 32 weeks. Participants' diet was monitored by self-report. The studies were selected and observationally evaluated by the author regarding the size of the variation in the energy intake and its possible correlation

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with the variation in the fat-free mass from the beginning of the preparation until the day of the competition.
Results: Of the four studies, the greatest average variation in energy intake (final minus initial) exceeded 1700 kcal and the smallest did not reach even 300 kcal. On the other hand, the study with the longest preparation time had the greatest loss of body weight even without applying the greatest energy variation between the studies in table 1 yet had the greatest fat-free mass loss with a worse result than the study with the shortest preparation time.
Conclusions: Observationally, higher caloric deficits in the bodybuilding athlete's food intake cannot closely correlated with negative changes in fat-free mass for the stage presentation.

Introduction

The total preparation for a bodybuilding competition basically involves two phases, the preparation phase, and the pre-competition phase, in which both tend to add up on average 32 weeks. During the pre-contest phase, bodybuilding athletes maintain a negative energy balance both by lower energy intake from the diet and by the longer time dedicated to training, to try reducing the body fat percentage, maintain a greater portion of fat-free mass (FFM) and to present a dense and dry physique on stage in the competition day [1]. Therefore, the bodybuilder is considered a competition in which athletes go through pre-establishment phases to prepare and are judged on their muscular appearance, poses, symmetry and thinness in proportional physiques [2].

The approaches generally applied to these athletes tend to bring severe energy restriction with a monotonous diet, which include food groups exclusions and carbohydrate consumption drastic reductions, something that can, instead of helping, harm the athlete's physique for competition day [3]. How in bodybuilding still not clear what is the best strategy to be applied for help in the maintenance of an athlete's FFM during the pre-contest phase due some confounders existing in their life such as how many training years they have and how many competitions participated, it becomes interesting to know, at least, which strategy should be avoided to help these athletes to show their better physique on the competition day keeping as much FFM as possible.

This, it has been shown that diets based on refeeding cycles are generally applied in the pre-contest phase may be sufficient to compensate for possible losses in FFM due to severe caloric restrictions [4], and when these athletes does not use refeeding days reducing drastically the calories in their diet on pre-contest phase, this may not guarantee a better reduction in body fat percentage [5]. By the way, the improvement in the physique of bodybuilder athletes on the day of the competition through the maintenance of the MLG achieved in the preparation phase was related to the reports of these athletes about the implementation of refeeding days during the pre-competition phase, precisely because of the possibility of strategies of refeeding influence the maintenance of fat-free mass [6]. Knowing this, it seems necessary to know the approximate level of body fat percentage that the bodybuilder athlete needs to have to start the pre-contest phase and not to worry so much about a significant loss of FFM and subsequent damage caused by this loss for the competition day and their performance on stage. So, this work presents a four recent articles subjective analysis that evaluated the bodybuilding athletes body composition at the beginning and end of their preparation, correlating the variations (final minus initial) on preparation time, energy intake, body fat percentage, fat-free mass, and body weight, with the fat-free mass maintains at the end of the preparation.

Methods

The author searched PubMed and ScienceDirect databases for recent studies involving the food consumption of bodybuilders when preparing for competition using the keywords “bodybuilding”, “diet” and “preparation”. 16 results were obtained from ScienceDirect and 8 from PubMed. The inclusion criteria were studies that involved amateur or professional bodybuilders, presented data on calories and body fat percentage at beginning and end of the preparation until 32 weeks including the preparation and pre-contest phases. Participants' diet was monitored by self-report. Two cross-sectional studies and two case studies involved the evaluation of the food consumption of forty-four male athletes practicing bodybuilding over eighteen years of age during their preparation. As this is an opinion and observational study, the author deduced his analyzes mathematically using the mean values without the standard deviation of the results of the analyzed studies. This in no way will worsen the analysis demonstrated in the discussion nor the critical conduct of the author towards the included studies. The studies were selected and observationally evaluated by the author regarding the size of the variation in the energy intake and its possible correlation with the variation in the fat-free mass from the beginning of the preparation until the day of the competition in order to find a possible correlation between the amount of deficit caloric intake applied to the bodybuilding athlete from the beginning to the end of their preparation with the likely variation of the fat-free mass.

Results

The values were obtained through the methodology of the included studies and mathematically analyzed by the author himself to calculate the initial and final values of the calories consumed. The total sample is clearly forty-four male athletes, because of the four studies included in the results, only one is cross-sectional and demonstrates the total amount analyzed without randomization. The studies methodologically evaluated by the author are shown in Table 1. It is noted that they are heterogeneous in all variations evaluated (energy ingestion, body fat percentage, fat-free mass, and body weight), including in all results collected there are losses in athletes body fat percentage. Of the four studies, the greatest average variation in energy intake (final minus initial) exceeded 1700 kcal [1] and the smallest did not reach even 300 kcal [4]. On the other hand, the study with the longest preparation time had the greatest loss of body weight even without applying the greatest energy variation between the studies in Table 1, yet had the greatest fat-free mass loss [7] with a worse result than the study with the shortest preparation time [8]. On the other hand, the fact in question that resulted in the work elaboration comes from the study that varied less the body fat percentage [4], for it was the study that brought a FFM total conservation in sixteen preparation weeks.

Discussion

As recently demonstrated, severe caloric restriction can be applied to the bodybuilding athlete during the pre-contest phase without further damage to his physique [6]. This is valid due to the refeed strategies applied in this phase, also recently demonstrated to help them maintain their training level

Table 1
Presentation of data variation regarding time and variations on the energy, body fat percentage, fat-free mass and body weight evaluated in the studies

Study	Type	Preparation time	Variation (final minus initial)	
			Energy	FFM
[1]	Cross-sectional study with 33 male bodybuilders (age 28.1 ± 3.94).	15–21 weeks	-1771 kcal	+1 kg
[7]	Case study with 25-year-old amateur natural male bodybuilder.	32 weeks.	-1462 kcal	-6 kg
[8]	Case study with 22-year-old male bodybuilder.	5 weeks.	-390 kcal	-1 kg
[4]	Cross-sectional study with 9 natural male bodybuilders (≥18 years of age).	16 weeks.	-214 kcal	0 kg

Abbreviations: BW: Body weight; BF: body fat; FFM: fat free mass.

and consequently their good physique for the stage presentation [5]. As shown in Table 1, a caloric deficit of 390 kcal between the preparation phase and the pre-competition phase [8] could not be correlated with a guarantee of total maintenance of fat-free mass in bodybuilders. In contrast, a caloric variation approximately four times greater, that is, 1771 kcal [1] was not able to induce loss of lean mass in these athletes between the same phases.

On the other hand, a caloric deficit of 1462 kcal [7] was able to induce a negative change in the fat-free mass of bodybuilding athletes for stage performance. Even being a value lower than the highest caloric deficit of 1771 kcal exposed in Table 1 [1]. This can be explained by other confounding factors that seem to be involved behind these previous analyses, such as training time and competition experiences, for example, making it impossible to say as a rule that the greater caloric deficit applied to the bodybuilding athlete during preparation could impair maintenance. of your fat-free mass for competition day. Thus, the works are inconclusive to state whether greater caloric deficits in food intake would be directly correlated with negative variations in fat-free mass for performance on stage.

Another hand, a caloric deficit intermediate to the two mentioned was able to induce a negative variation between in the fat-free mass of bodybuilding athletes for the stage presentation. Because, other confounders seem to be involved behind these previous analyses, such as training time and competition experiences for example, making it impossible to say as a rule that greater caloric deficit applied to the bodybuilding athlete during a preparation could impair the maintenance of their fat-free mass for the competition day. Thus, the works are inconclusive to affirm whether greater caloric deficits in food intake would be directly correlated with negative variations in fat-free mass for the performance on stage presentation.

It is not known for sure which metabolic pathway implies the correlation between the maintenance of fat-free mass in a bodybuilding athlete and the need for moderate or non-severe calorie restriction in the pre-contest phase. Therefore, more clinical studies are needed to assess whether there is any harm to apply greater caloric deficits during preparation for the bodybuilder athlete.

Conclusion

Observationally, higher caloric deficits in the bodybuilding athlete's food intake cannot closely correlated with negative changes in fat-free mass for the stage presentation.

Authors' contributions

The main author oversaw all the reading and review of the literature used in this work.

Conflicts of interest

The authors declare that they have no competing interests.

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