

## Nutritional Recommendations for Bodybuilding and Ramadan: Intermittent Fasting for Strength Training

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### Abstract

Most Muslims fast during the holy month of Ramadan from dawn till sunset, when they neither eat nor drink, as it forms one of the fundamental obligations of the Muslim faith. Muslim athletes, including strength athletes, employ a variety of coping strategies to deal with the challenges of training and competing during this month. Published data on the effects of Ramadan on body composition following resistance training are scarce. The aim of this review was to explore the changes that occur in body composition in body builders during Ramadan. The majority of the studies identified in this review reported no significant effect on the body composition of athletes during Ramadan. Hypertrophic resistance training has generally been found not to be affected in terms of body composition when performed in a fasted state. However, well-designed scientific studies investigating the effects of resistance training in the fasted state during Ramadan or other periods of intermittent fasting on body composition are lacking and warranted.

**Keywords:** *Body composition; Weightlifting; Weight training*

### Introduction

The commemoration of Ramadan occurs during the ninth lunar month of the Islamic calendar and lasts 29-30 days [1]. Most Muslims fast during the holy month of Ramadan from dawn till sunset, when they neither eat nor drink, as it forms one of the fundamental obligations of the Muslim faith [2]. Typically, two meals are eaten each day: one just before dawn (*Sohoor*) and one after sunset (*Iftar*) [3]. Energy and water intake are often reduced during this month and may result in alterations in body composition. Although the Ramadan model of fasting is amply known, the physiological changes induced during this period are not well known.

People who participate in Ramadan often continue physical activity during the holy month for recreation and health purposes, and this has further potential to alter body composition. Muslim athletes, including strength athletes, use a variety of coping strategies to deal with the challenges of training and competing during this month [4]. Some Muslim athletes train at night to prevent dehydration, hypoglycaemia and possible reductions in performance. In regards to weight lifting, it has been shown that resistance training while fasting affects the post-workout anabolic response to weight training more favourably than training after a fed-state, but only when a carbohydrate/ protein/ leucine mixture was ingested following a heavy resistance training session [5]. Published data on the effects of Ramadan on body composition following resistance training is scarce. The aim of this mini-review is to explore the changes that occur in body composition in body builders during Ramadan and to describe the typical eating patterns of body builders during Ramadan.

### Typical training patterns in bodybuilding

Bodybuilding is the practice of performing regular exercises with the objective of increasing muscle strength and size. While training patterns differ from one individual to another, an example of the workout routine of a professional bodybuilder is as follows:

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Exercise is divided into 2 to 3 workouts per day. The exercise training program consists of 2 hours of aerobic activity per day and 3 hours of strength training per day. Aerobic workouts are continuous during 1 hour and may consist of cycling or stair climbing. A pattern of 4 consecutive workout days and 1 rest day is followed [6].

### Nutrition guidelines for strength sports

**Nutrition plays an important role in three aspects of training for strength athletes:** Fuelling of sport-specific and strength training, recovery from this training, and the promotion of training adaptations, including skeletal muscle hypertrophy [12]. Given the increased muscularity of bodybuilders and the association between muscle mass and total energy expenditure, current strength-athlete guidelines for energy stand at about 185-210 kJ/ kg<sup>-1</sup> of body mass [6].

As for carbohydrates, because the damage that occurs to skeletal muscle during resistance training weakens muscular glycogen re-synthesis, encouraging bodybuilders to sustain a moderate carbohydrate intake seems to be accurate. Current guidelines propose an intake of approximately 6g/ kg<sup>-1</sup> of body mass for male body builders and less for female body builders.

Body builders often depend on dietary information provided by other bodybuilders, supplement makers, and popular media [6]. The higher levels of muscle growth and repair achieved by bodybuilders generally justify a higher total dietary protein and energy intake; however, excessive dietary protein intake is common in body builders. Strength-trained athletes have advocated high protein diets for many years. While defence for and against the need for additional protein among resistance-trained individuals continues, general guidelines currently recommend an intake of 1.6-1.7g protein/ kg<sup>-1</sup>/ day<sup>-1</sup> (Phillips, 2004). Considering the relatively wide distribution of protein in a meal plan of a bodybuilder, and the generally increased energy intake, the majority of athletes can easily achieve these levels of protein intake. Exceeding the upper range of protein intake guidelines offers no further benefit and simply promotes increased catabolism and oxidation of proteins [7].

The intake of dietary fat of strength-training athletes tends to be higher than that recommended for the general population [8]. This fat tends to be derived from sources rich in saturated fats, most likely due to the pursuit of higher protein intake from animal-based foods [9].

### Optimum physique in bodybuilding

In weight lifting disciplines, physique traits influence performance in several ways. Bodybuilders tend to have low body fat, enhancing the development of strength per unit mass [10]. Successful weight lifters also have a higher sitting height to stature ratio with shorter limbs, creating a biomechanical advantage for their discipline [11]. Differently to other strength disciplines, bodybuilding is unique in that success in competition is judged purely on the basis of size, symmetry, and muscle definition [12].

### Existing dietary practices of bodybuilders

Although the dietary practices of professional body builders may vary, they tend to follow the same monotonous style. A description a typical meal plan design for a professional body builder has been described as follows:

The dietary goals of the participant studied were to consume a high carbohydrate diet with moderate amounts of protein, 1-2g/ Kg and minimal dietary fat. By design, energy intake was high to help maintain lean body mass during training. To achieve his dietary objectives, the reported bodybuilder ate the same types of foods daily and never ate out. His diet was made up of large quantities of grains and cereals, including brown rice and oatmeal. Vegetables included potatoes, yams, beans, corn, peas, carrots, broccoli, green beans and lettuce. His fruits were mainly berries. Lean meats included chicken and fish, with the rest of his dietary protein coming from egg whites and moderate amounts of low to fat milk. This food was supplemented with a high carbohydrate glycogen replacement sport beverage and 12.8g/day of amino acids and 1278 Kcal/ day of medium-chain triglycerides [13].

It is worth noting that high-protein diets are extremely popular among bodybuilders, with consumption levels having been reported at 324-653g of protein/ day [14].

### Methods

This review examines the data on the nutritional recommendations for body building and Ramadan, that is, intermittent fasting for strength training. Leading databases, including *Web of Science*, *Medline*, *PubMed* and *Science Direct* were consulted and manual searches for cited references in leading nutrition-related journals were conducted. Papers were considered when written in English, published between the years 2005-2015 and reporting on original data of dietary intake of bodybuilders plus body composition.

The database search was built by using the following combination of terms: Bodybuilding (weight lifting, resistance training, weight training, Olympic weight lifting, body sculpting) and Nutrition (diet, dietary assessment, eating, consumption, food groups, food habits, food preferences, food selection, intake, nutrient intake, nutrition assessment, dietary patterns; and their combinations) not (clinical trials OR patients). In addition, for the focused search on Ramadan the following terms were added: (fasting, intermittent fasting, religious fasting, not eating; and their combination). For each concept, the database-specific indexing terms (MeSH or Web of Science terms) were searched in addition to terms in the title or abstract. An additional manual search was performed by checking the reference lists of the key publications identified. The output table captured key characteristics of the following:

- a) Study methodologies: the country and year of the study, the number of subjects and their gender, dietary assessment method and
- b) Primary (qualitative) study outcomes: dietary patterns identified and body composition evaluation method.

### Findings and Discussion

Fasting periods have been classified as either caloric restriction (CR), alternate-day fasting (ADF), or dietary restriction (DR). CR refers to the reduction of calorie intake by a certain percentage of normal consumption. ADF consists of alternating 24-hour periods between feasting and fasting. DR is a reduction of one or more components of dietary intake. The month of Ramadan represents a prolonged intermittent fasting period inducing a phase shift in caloric intake and a modification of the sleep-awake cycle, thus Ramadan is similar to ADF.

As would be expected due to the dietary restrictions during Ramadan, caloric intake is often reduced during this month, which may result in reduced body weight [3,15,16]. However, the majority of the studies identified in this review reported no significant effect on body composition of athletes during fasting periods such as Ramadan [17,18]. Trabelsi, *et al.* [19], reported no effect on body mass and body composition of bodybuilders during Ramadan while on continuance of hypertrophic training. This is in opposition to what has been reported by studies looking into the effects of aerobic training on body composition during a fasting period where a decrease in body mass was reported [19]. The effects of Ramadan on body mass profiles is inconsistent. Decrements in body mass observed during Ramadan have been attributed to fat loss [17]. A possible explanation for this may be that participating in a fasting period such as Ramadan appears to improve the ability to utilize lipids during aerobic exercise, perhaps providing an increased opportunity to reduce body fat stores if exercise is performed regularly during the fasting month. On bodybuilders who fast, the lack of change in body composition may be partially due to the maintenance of training volume, total energy intake and macronutrient distribution. In addition, the discrepancy between studies who have found alterations in body composition and those who have not may be partly originating in the complexity of athletic performance and the effect that faith can have on motivation and overall performance [20].

During Ramadan changes reported in feeding patterns include the intake of larger meals as means to compensate for lower frequency of food ingestion. For that reason, total energy intake during Ramadan tends not to differ compared to prior to the initiation of the fasting month, contrary to common belief. A description of macronutrient consumption before and during Ramadan described an increase in fat and decrease in protein intake, with no changes in carbohydrate intake. Changes however did occur in the carbohydrate sources, shifting from complex to simple sugars [21]. Traditional foods consumed during the month of Ramadan that are rich in fat and sugar include *thareed* (flat bread layered with lamb stew), *harees* (boiled wheat mixed with meat) and *luqaimaat* (deep-fried egg based sweet covered

with honey). In addition, the intake of cooked vegetables tends to increase. Whole fruits tend to be reduced although the intake of juice and dates increases. During Ramadan milk and milk products tend to be less consumed and lean meat tends to be replaced with medium and high fat meat preparations [21].

### Overview of special requirements for energy and fluids during hypertrophic training throughout Ramadan

Due to the restricted opportunity for energy and fluid intake during the fasting month of Ramadan it is recommended that bodybuilders adjust their eating patterns and hydration practices to minimize any potential alteration to their body composition. Further, if the month of Ramadan falls in summer, practicing physical activity during the day places additional stress on electrolyte balance and possibly also on metabolism [19]. Some of the more common nutrition problems that arise for bodybuilders during Ramadan include an insufficient energy intake due to the restricted eating hours, insufficient micronutrient intake due to the prioritization of satiation and palatability when making food selection during the non-fasting phase of the 24-hour cycle, and insufficient fluid intake.

### Conclusion

Bodybuilders partake in a multitude of practices that may place them in high-risk health categories. Hypertrophic resistance training has generally been found not to be affected in terms of body composition when performed in a fasted state. It is essential that health care workers in contact with bodybuilding athletes intervene and educate them about healthy dietary and training alternatives. Despite there being over 1 billion Muslims worldwide, the influence of Ramadan on exercise performance remains unclear. Well-designed scientific studies investigating the effects of resistance training in the fasted state during Ramadan or other periods of intermittent fasting on body composition are lacking and warranted.

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