

The Influence of Aerobic Fasting on the Body Composition of Trained Individuals: a Mini Review

Matheus Santos de Sousa Fernandes^{1, 2*} and Gabriela Carvalho Jurema Santos³

- 1 Faculty of Communication and Technology and Tourism of Olinda–Facottur, Brazil
- 2 Postgraduate Program in Neuropsychiatry and Behavioral Sciences, Federal University of Pernambuco, Recife, Brazil
- 3 Postgraduate Program in Nutrition, Federal University of Pernambuco, Recife, Brazil

***Corresponding author:**

Matheus Santos de Sousa Fernandes

✉ matheus.sfernandes@ufpe

Tel: +5581996395116

Faculty of Communication and Technology and Tourism of Olinda – Facottur, Federal University of Pernambuco- Physical Education Department, Recife, PE, Brazil

Citation: Fernandes MSS, Santos GCJ (2021) The Influence of Aerobic Fasting on the Body Composition of Trained Individuals: a Mini Review. Health Sci J. 15 No. 6: 846.

Abstract

Aerobic training has been considered as a good strategy to improve physical conditioning, body composition and health promotion. The present study sought to analyze the influence of fasting aerobic training on the body composition of trained people. For this, a bibliographic review of the literature was carried out based on the survey of theoretical references already analyzed and published by written means such as books, theses and monographs and electronic bases such as Scielo and PubMed, seeking a clear analysis of the results requested in the body composition of individuals trained to apply fasting aerobics. In this work, it is possible to understand how fast aerobic training can influence body composition and be an alternative to reduce adipose tissue.

Keywords: Aerobic training; Fasting; Body composition

Received: June 09, 2021, **Accepted:** June 23, 2021, **Published:** June 28, 2021

Introduction

Advances in different areas such as social, environmental, political, economic, and scientific have increasingly influenced improvements in conditions, quality, and life expectancy. In this context, the practice of physical exercises is related to the increase of energy expenditure, improvement of physical fitness and control of blood rates that obesity causes to increase such as glycemia, triglycerides, blood pressure and cholesterol, causing pathological states and health risks. Positive changes in body composition are a consequence of healthy eating habits associated with the practice of physical exercises. In other words, changes such as the decrease in the percentage of fat and the increase in the amount of lean mass are obtained by adhering to a healthy lifestyle.

It is known that aerobic physical training induces great adjustments in the obese organism, such as fat reduction, total body mass, increase in cardiorespiratory fitness and metabolic control. However, such adjustments seem to be dependent on the intensity of the physical effort performed [1].

Practitioners of physical exercises at sometimes question themselves about performing fast exercises for convenience, in situations where there is no time to make a meal before and for aesthetic purposes. The theoretical basis used by practitioners is the idea that fasting increases the depletion of glycogen stocks decreasing the availability of carbohydrates and thus the practice of exercises will use fat as a priority energetic substrate. The low availability of carbohydrates induced by fasting causes a decrease in insulin concentration, an increase in adrenaline,

noradrenaline, cortisol, and growth hormone concentrations. In these conditions, the body increases the oxidation of fats to obtain energy [2].

The intensity and caloric intake seem to have an influence on the result, but it is not yet known what effects on body composition fasting aerobics can cause. This study aims to identify the influence of aerobic fasting on the body composition of trained individuals.

Methods

This study is a bibliographic review, which seeks to highlight the effects of aerobic training in fasting when performed by trained individuals. As a data source, SciELO and PubMed virtual databases and books were used. The idioms were in English and Portuguese. The target audience of this study are professionals of Education and practitioners of physical exercises that besides

health, aim to improve the body composition. The following keywords were used in the search process during the research: Aerobic Training; Fasting; Body Composition and its equivalents: Aerobic training; Fasting; Body composition. Recent articles were included to bring the discussion closer to the current context.

Results

The research was based on the analysis of the following scientific articles related to the influence of fasting aerobics on the body composition of trained individuals, detailed in **Table 1**. After the complete reading of these studies, all contents were analyzed specifically with the focus on the objectives of the study and considerations.

Discussion

The present study ratifies previous evidence on the study of Paoli et al. [3] is one of the most used to contest the effectiveness of aerobic fasting, it checks the difference in fat metabolism during a moderate aerobic exercise (36 minutes /65% Heart rate) in the morning in two situations: Feeding and in Fasting. Twelve hours after the exercise, the group that fed continued with high volume oxygen maximum (VO₂max), while the respiratory quotient reduced significantly, indicating greater use of fats in the fed situation, but not when the exercises were done fasting. And 24 hours after exercise, the difference was even greater, with higher energy and fat expenditure for those who fed before exercise.

Table 1 Characteristics of the articles included.

Title	Author/Year	Description/ Main Results and Conclusions
Doing fast or fed exercises to increase fat loss? Influence of food intake on respiratory ratio and excess post-exercise oxygen consumption after a resistance training session.	Paoli et al. [3]	This study was carried out with two groups of trained men, who were submitted to resistance training tests where one group performed after the 12-hour fasting period and the other fed. It was concluded that the RER (reaction of respiratory exchange) was less 12 and 24 hours after the session of exercises in the group that carried out the test fed than in the group that carried out fasting. Thus, a prolonged effect in the use of the substrate occurs with a change in direction to the lipids with the feeding before the exercise. In the same conditions, feeding before exercise demonstrated that VO ₂ remained higher in 12 and 24 hours, indicating an increased EPOC effect. Training after breakfast allows the maintenance of a higher VO ₂ than training in fasting.
Interval training in the feeding or fasting state improves body composition and muscle oxidative capacity in overweight women	Gillen et al. [4]	The study showed that low volume 6-week High Interval Training (HIT), consisting of only 30 minutes of exercise within a time commitment of 1 hour per week, improved body composition including reduction of adiposity at the abdominal level of the entire body, increase in lean leg mass. and the oxidative capacity of skeletal muscle in overweight and obese women. These adaptations were made regardless of when food was ingested around the acute training sessions and provide evidence to suggest that HIT is an efficient and effective exercise strategy to improve fitness in overweight women.
Beneficial metabolic adaptations due to fasting resistance exercise training	Proeyen et al[5]	In this study the results clearly demonstrate that consistent fasting physical training markedly stimulates the contribution of the IMCL to energy supply during fasting resistance exercise. Fasting training also increases muscle oxidative capacity more than similar intensity and duration of exercise with ample supply of exogenous carbohydrates. In addition, fasting training prevents the drop in blood glucose concentration during fasting exercise. The findings, therefore, provide evidence to indicate that regular fasting training is a useful strategy to stimulate physiological adaptations in muscles that may eventually contribute to improved performance in endurance exercises.
Exercise, energy balance and body composition	Westerterp[6]	The study concluded that in sedentary individuals, exercise affects the balance energy and body composition. The energetic imbalance reached is generally lower than the prescribed energy expenditure with exercises, especially in individuals with normal weight. In overweight and obese individuals, the individual responses of physical training in energetic balance and body composition are highly variable and reach a plateau with time. At a group level, exercise training results in a negative energy balance of about from 2.0 MJ per day with an exponential decline to 0.5 - 0.0MJ per day in studies over 1 year. The effects of physical training on REE and the activity without training are insignificant. The most likely explanation for a return to energy balance is a compensatory increase in energy intake.
Aerobic training in obese adolescents: a multidisciplinary approach	Gomes et al[1]	This study ratifies previous evidence on the effectiveness of multidisciplinary interventions in obese adolescents in improving regional and total body composition and adds to the current literature information on the effects of different intensities of aerobic physical training in this population, suggesting that the effects on body composition are independent of the training intensity for obese adolescents. This information is significant and relevance, since these findings allow generalizations, since aerobic exercises can be performed in different ways and in different places, expanding the options in terms of public health.

Thus, the authors concluded that moderate aerobic exercise for weight loss, performed while fasting, does not increase the oxidation of fat and a light meal is advisable. Gillen et al. [4] showed that fasting was not superior after six weeks of high intensity interval (HIIT) training in overweight and obese women. The improvement of body composition considering the decrease in fat percentage, increase in lean mass and oxidative capacity of skeletal muscle. These adaptations were made regardless of when the food was ingested. This fact shows that it is not the state of fasting that favors the oxidation of fat, but the intensity of exercise.

In an analysis of Proeyen et al [5] shows that 120 minutes of aerobic exercise at up to 60% of maximum VO₂ causes increased degradation of intramuscular fat for energy supply during exercise practice [6]. Because it is low intensity exercise, there is no significant increase in catecholamines and therefore no increase in glycogenolysis [7]. The increase of the muscular oxidative capacity did not cause a drop in glycemia. If the fat burns in a carbohydrate fire, and you do not have enough glucose, you cannot burn fat. With this, besides the increase in muscle oxidative capacity, there was also an increase in mitochondrial biogenesis. The study by Westerterp [6] shows that the energetic balance and body composition are influenced by the practice of exercises in overweight and obese individuals with a difference in results, but an inevitable plateau. Only the practice of exercises seems to have limits in the influence of body composition and with this we understand that the nutritional adequacy is fundamental to maintain the results and continuity of them.

Gomes et al. [1] shows that nutritional, psychological, and clinical intervention combined with aerobic exercise in obese adolescents seems to be the best strategy for weight loss. The aerobic exercise in different forms and intensities is shown as the main alternative when looking for improvement in body composition reducing the percentage of fat. In this case, the study shows evidence of the effectiveness of independent aerobic training, but with the proper multidisciplinary monitoring. The aerobic fasting performed in an isolated way, without the proper nutritional adequacy does not seem to be the best alternative to improve the body composition.

Conclusion

Considering what was shown in the work we understand that

even though it is not the best option for reducing the percentage of fat, the practice of aerobic exercise on fasting with the proper adjustment of intensity can be especially useful, but provided it is done in a conscious and systematic way. The aerobic exercise in fasting, with low and stable levels of glycemia, makes an identification of greater energy demand, however, with the low stimulation of catecholamines, there is no increase in energy supply in the form of glucose through glycogenolysis and thus, as adaptation the body acts as if there was a deficiency in the mitochondria and with this happens the mitochondrial biogenesis. For fitness/bodybuilding athletes this is important and very efficient because the more enzymatic capacity he has, the more energy he can consume, the more muscular and defined he can stay. The reality of most bodybuilding practitioners manages to increase their lean mass, but with this they also increase the percentage of fat.

To reduce the percentage of fat basically the caloric consumption decreases, however, the muscle depends on the caloric consumption and in a situation of caloric restriction lean mass is also lost. With this we can understand that the corporal composition depends much more on the metabolic capacity, the nutritional aspect, and the practice of exercises in a systematized way than of a specific method as aerobic in fasting. However, it is necessary to make some observations. The studies consider only one physical activity per day and the most common is that the practitioners of aerobic exercise on fasting do it in the morning and the training resisted in some hours later.

In Paoli's study, fasting was 12 hours and the most common is a nocturnal fast of 8 hours on average and this can influence the change of results considering the metabolism after the exercise, considering that 12 hours of fasting increases the importance of hepatic gluconeogenesis. Not necessarily the differences in fasting periods will impact on the result, but the choice of exercise, whether fasting or feeding. It is also important to consider that many fasting aerobics fans use anabolic hormones (androgenic steroids, GH) and thermogenic. This can induce metabolic changes during and after exercise. I conclude that to say that fasting aerobics have no functionality is a mistake and to say that it is the best form of aerobic exercise is speculation. To improve the body composition the most important is to keep performing exercises in a regular and planned way according to the individuality, need and satisfaction of the practitioner.

References

- 1 Gomes PP, Lofrano-Prado MC, de Lira CTC, Tenório T, Botero JP, et al. (2018) Aerobic training in obese adolescents: A multidisciplinary approach. *Revista Brasileira de Medicina do Esporte* 24:280-285.
- 2 Wilmore JH, Costill DL, Kenney WL (2009) *Physiology of sport and exercise* (5th edn).
- 3 Paoli A, Marcolin G, Zonin F, Neri M, Sivieri A, et al. (2011) Exercising fasting or fed to enhance fat loss? Influence of food intake on respiratory ratio and excess postexercise oxygen consumption after a bout of endurance training. *Int J Sport Nutr Exerc Metab* 21:48-54.
- 4 Gillen JB, Percival ME, Ludzki A, Tarnopolsky MA, Gibala MJ, et al. (2013) Effect of two different training models (Functional training and HIIT) on body composition and cardiorespiratory resistance in women with overweight or obesity. *Obesity* 21: 2249-2255.
- 5 Van Proeyen K, Szlufcik K, Nielens H, Ramaekers M, Hespel P (2011) Beneficial metabolic adaptations due to endurance exercise training in the fasted state. *J Appl Physiol* 110:236-245.
- 6 Westerterp KR (2018) Physical activity and energy balance. *Eur J Clin Nutrition* 72: 1246-1250.
- 7 Martin WH (1996) Effects of acute and chronic exercise on fat metabolism. *Exerc Sport Sci Rev* 24: 203-230.