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Food for the Olympic Athlete Experts' Opinion and Practices in Antiquity



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Abstract

Purpose

This study aimed to identify how the opinions held by ancient physicians on athletes' diet compare to relevant guidelines for the general population. A secondary aim was to examine the evidence from Greek and Latin classical texts regarding dietary practices for ancient Olympic athletes.

Approach

The dietary approaches deemed suitable for supporting athletes' nutrition were retrieved from the treatises of the major medical authorities of antiquity and from passages of the ancient Greek and Latin literature.

Findings

Physicians and other experts considered beef as the most suitable when strength performance was required, while goat meat and pork were preferred for the good condition of the muscular system and long-lasting contests in heavy events, respectively.

Value

The systematic examination of the diets adopted by elite competitors may contribute to our understanding on how relevant views have evolved during the history of the Olympic Games.

Keywords

ancient Olympics; elite athletes' nutrition; dietary approaches; human performance; dietary supplements; Olympic Games.

Introduction

The Olympics are as much an athletic event as a cultural and political festival, and victory in the games conveys great glory to the athletes and their states. Some ancient Olympic victors are known to have become leaders of their cities in battle, including the Olympic wrestler Milo of Croton, who apparently led the Crotoniate army to victory against a rival city, dressed as Hercules, complete with club and lion skin (Crowther, 1999). The unprecedented privileges that Olympic victors enjoy have fuelled the need for advancing performance to near perfection. This need is not unique to our era; athletic preparation for the Olympic Games was also important in antiquity. For modern and ancient writers alike, Olympic Games are the highlight of athletic endeavour. As evidenced by the well-known treatise of Philostratus, the *Gymnasticus*, initially, training in athletics was not distinguishable from training for battle; therefore, early athletic events were organised exclusively in the context of military preparation (Philostratus, n.d., p.43). However, some dietary manipulation, aiming to sustain strength and stamina during athletic competitions, has been in place since this early time (Fenwick et al., 1985). Garlic was a natural supplement given to Olympic athletes in Greece; it is related as one of the earliest “performance enhancing” agents (Lawson, 1998; Rivlin, 2001).

The knowledge that fuelling the body with food is of paramount importance for soldiers is present even in the Homeric Iliad, where a remark is made that unless food and liquid are taken during a battle, one’s “knees eventually grow weary as he goeth” (Homer, n.d., T 163-170). The ancient Olympic Games were founded in 776 BC; however, much of the early writing on athletics was written during the classical period of Greece, in the 6th and 5th centuries BC. Surviving Greek and Latin classical texts document ancient sporting events and activities, as well as diet strategies and training techniques. However, texts that identify actual food patterns of ancient athletes are rare. It has been well documented that the diet of most Greeks and Romans consisted of cereals, fruit, vegetables and legumes, and wine diluted



with water, supplemented with small quantities of fish and even smaller quantities of meat (Flaceliere, 1965; Dalby, 1996; Garnsey, 1999). Athletes basically followed a diet in line with that of common people, but as more athletic events were established, athletic preparation became a challenging task that required substantial expertise (Mouratides, 1998). The philosopher Epictetus (1st C. AD) demonstrates this principle clearly in his text, *Discourses*:

“Olympic champions first determine what they would be, and then act accordingly. To a racer in a longer course there must be one kind of diet, walking, anointing, and training; to one in a shorter, all these must be different; and to a Pentathlete, still more different”
(Epictetus, n.d., 3.23).





The athletes' diet became the responsibility of professional trainers (the *gymnasts*); these trainers could address the needs of the athletes according to their particular event, and were knowledgeable about how to guide their trainees to manage their body weight, get rid of excess fluids and increase their muscular mass (Philostratus, n.d., p.14). The ancient Greeks were well aware of nutrition as a major determinant of athletic performance, and athletic diet was regarded as so significant that a close relationship between athletic training and medicine was generally acknowledged (Young, 2004). The athletics' trainers spent time helping an athlete improve his technique, and most devoted great attention to the athletes' diet (Young, 2004). The first trainer known to us by name is

Herodicus of Megara, who taught medicine to the great Hippocrates. In the body of medical writing that has come down to us under the name of Hippocrates, it is made clear that the insistence of Greek doctors on the importance of diet is due to their early interest in the diet of athletes (Harris, 1966). Epictetus, for instance, used the analogy of a skilled craftsman who learns to excel in his craft through training to illustrate the concept that training and diet are the two prime environmental parameters that determine the development of an athletic body-type for top athletes (Epictetus, n.d., 3.21). At the same time, he insisted that a disciplined diet was an absolute prerequisite for those athletes who wished to wear the Olympic wreath:

"You must conform to rules, submit to a diet, refrain from dainties, exercise your body, whether you choose it or not, at a stated hour, in heat and cold, you must drink no cold water, and sometimes no wine" (Epictetus, n.d., 3.15).

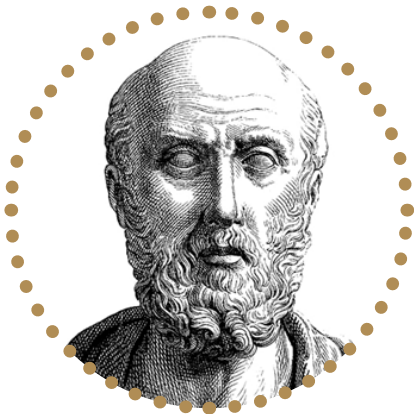
Evidence on athletic nutrition in antiquity is based entirely on literary sources. Raschke (1988), Applegate and Grivetti (1997), Grandjean (1997), Grivetti and Applegate (2004), and Grivetti (1997) have provided accounts on the views about athletic diet and training in the ancient Mediterranean, indicating the importance of meat. Wilkins and Hill (2006), in their critical review of ancient medical texts, provide useful information on how the dietary behaviour among soldiers and heavy workers differed from that of common people.

The present work aims to identify how the opinions held by ancient physicians on athletes' diet compare to relevant guidelines for the general

population. In this context, dietary approaches deemed suitable for supporting athletes' nutrition were retrieved from the treatises of the major medical authorities of antiquity: the Hippocratics in the 5th century BC, Galen in the 2nd century AD, and Oribasius in late antiquity. This work also examines the evidence from Greek and Roman authors regarding dietary practices for ancient athletes. These include passages from Plato, Epictetus, Aristotle, Diogenes Laertius, Chrysostom, Eusebius, Pollux, Aelian, Porphyry, Pausanias, Philostratus, Zenon, Pliny the Elder and Athenaeus. To accomplish the above, a number of passages that were not utilised in earlier scholarship on this subject were considered.

Medical Views on Athletic Diet in Antiquity

Ancient physicians were deeply concerned with the role of diet in health and wellbeing. As athletic preoccupation became a professional endeavour, the athletes' routine became a common topic for investigation. In fact, it has been argued that the insistence of Greek doctors on the importance of diet stems from their early interest in the diet of athletes (Harris, 1966). For instance, in his *Politics*, Aristotle advises the youngsters who wished to become athletes on the best time to start enriching their diet, i.e., three years after they had entered puberty (Aristotle, n.d., 1338b-1339a). The Hippocratic view was that food and exercises should be prescribed in such a way so as to complement each other and create "balanced relative proportions" (Hippocrates, n.d.c, 1,2.18-36). Therefore, the Hippocratics formulated the everlasting principle according to which human health depends on the balance between diet and exercise, two elements that have "opposing properties", but equally contribute to health.



Hippocrates



The role of individual temperament and make-up is clearly acknowledged in the Hippocratic texts. The physician must follow the proper nature (*fysin*) of every man and cannot commit himself to pre-constituted schemes. The texts also reveal the physicians' concern about formulating dietary guidelines specific to those under athletic training. Although not aware of the complex biological processes behind food metabolism and body mass growth, The Hippocratics made the link between nourishment and muscular growth, as evident from a passage in *Regimen*: "For the flesh, growing warm and dry, draws to itself the nourishment through the passages and then it grows"



(Hippocrates, n.d.b, 2.64). The notion that a diet based on grains is not appropriate for the athletes is encountered in the medical treatises and, therefore, also the idea that foods of animal origin are better suited to the needs of people who are under training. The Hippocratic authors maintain that, with the exception of wheat bread and barley rusks, the cereals and pulses commonly eaten by Greek peoples provide little and weak support of growth, strength and health (Hippocrates, n.d.a, p.61). In *Regimen* it is stated that among the various common foodstuffs, only wheat, barley, meat and wine may provide for body strength without an increased quantity being required; this is particularly so if the plants have been grown without much access to water (in waterless lands) (Hippocrates, n.d.b, 2.56).

Galen, who adopted and systematised the Hippocratic humoral system in his treatise *On the Properties of Foodstuffs*, maintains that barley porridge (*ptisani*), although well suited to the needs of lay people, falls behind in supporting a training man's needs as, "very soon he would be in a sorry plight and wear out his whole body" (Galen, n.d.b, 1.488). Galen singles out unleavened bread as one of the foods that should normally

be avoided because it is *humorous* and hard on digestion (*concoction*). However, he remarks that heavyweights are known to consume unleavened bread regularly (Galen, n.d.a, 180). Galen makes a clear distinction between lay folk and athletes who, the same as labour peasants, are eating what "none of us can tackle and concoct" (Wilkins and

Hill, 2006, p.193). Ancient doctors were particularly

interested in the effects that meat consumption has on athletic performance. Through systematic observation, they wished to determine how exercise capacity and athletic performance vary in relation to the quality of meat eaten. However, it should be noted that their prime concern was the needs of athletes involved in heavyweight sports and, therefore, much of the evidence does not directly relate to other athletes, namely racers and long jumpers (Harris, 1966).

The Hippocratics evaluated the quality of the common kinds of meat as follows: beef is "strong and binding" albeit "hard of digestion", goat meat is "lighter" compared to beef and easier on digestion, while pork "affords more strength to the body":

"as to animals which are eatable, you must know that beef is strong and binding, and hard of digestion, because this animal abounds with a cross thick blood... Goats' flesh lighter than these, and passes better by stool. Swine's flesh affords more strength to the body than these and passes well by stool, because this animal has small anaemic veins, but much flesh" (Hippocrates, n.d.b, 2.46-49).

The view that goat meat is lean and more digestible compared to beef and pork was shared by other physicians who also thought of kid meat as the best choice for athletes who were interested in preserving their physical condition. Due to its prime digestibility and superior nutritional qualities, the meat of the suckling kid, and for some, the meat of the suckling lamb, was also viewed by Oribasius as best suited for recovery after strenuous exercise. In this respect, kid meat's beneficial qualities were attributed to its "nervous and sticky" character, rendering it capable of becoming incorporated into a body's "substance for a long time", unlike the meat of pigs and sheep that are characterised as being of high fat content:

"... for the juice of that meat [kid's] is nervous and sticky, and such as can remain a long time in the substance of the body... and all the meat of pigs and lambs, while it remains undigested in the system, is very apt to turn, because of the fat" (Oribasius, n.d., 2.68).





The case of an athlete who was known to have “... surpassed all the men of his time in strength, because he was nourished on goat’s flesh” quoted by Athenaeus in the 1st century AD (Athenaeus, n.d., 9.66) is in line with the physicians’ evaluation. Similarly, Galen acknowledged the drawbacks of pork meat compared to kid meat, in that it is

dyspeptic because it contains “fatty and glutinous” substances. However, for wrestlers and boxers in particular, these qualities of pork, i.e., difficult to corrupt while not easily dispersed, are anything but undesirable, since they have the capacity to sustain the athletes in exceptionally prolonged sessions of training or contesting:

“Athletes take very wholesome foods, but the heavyweights among them, especially, take foods that are fatty and glutinous. Since their whole preparation is with a view to contests in which sometimes they must wrestle, or fight in pankration, all day long, for this reason they also need food which is both difficult to corrupt and not easily dispersed” (Galen, n.d.b, 1.487-488).

Galen describes the experiment he conducted among heavyweight athletes to reach the conclusion that pork meat is the most nutritious of all foods (Galen, n.d.b, 3.661). Galen’s experiment, in contemporary terms, would qualify as a controlled feeding trial. He checked the validity of these observations both in teenagers under training and in men engaging in strenuous manual work and found that “*the same test of the statement in the case of youths being worked hard in the wrestling school, and in people carrying out any forceful and energetic activity whatsoever, like that of ditch-diggers*” (Galen, n.d.b, 3.661).

The perceived quality of meat was also dependent on other factors, such as the age of the animal. Oribasius claimed that while the meat of recently weaned ruminants should be the prime choice, meat from older, but still young, animals (i.e., while at a reproductive age) can still be useful to active people, such as resistance athletes, who

have good digestion (Oribasius, n.d., 2.51). He makes the distinction between resistance athletes and racers, whose primary concern is not strength, but endurance. When considering quality of meat, the diet of the animal was also taken into account. Therefore, pigs that lived in forests and subsisted on cornels and acorns are better for the athlete than those reared on a home-diet. Oribasius also commented on the suitability of fish, the typical complement (opson) to the grain-based diets in his era, claiming that those who train regularly should take care to include fish and other nutritious foodstuffs in their diet (Oribasius, n.d., 2.51). In addition to fish, cheese was also a complementary food widely used by the Greeks. Mentions of cheese and dairy in regards to the athletes’ diet are generally rare in ancient medical texts. One such mention we find in Dioscorides (Dioscorides, n.d., 2.79) for unsalted fresh cheese as a food capable of promoting the growth of one’s body mass.



Dietary Practices of Ancient Athletes

The prevailing views on the diet of athletes in antiquity were derived from ancient Greek and Roman literature. The diet was considered to be an essential parameter for an athlete to develop muscle, strength and good physique towards the maximisation of performance. In the early days of the Olympic Games, athletes followed a diet based on “*dried figs, fresh cheese, and even on wheat-meal*” (Diogenes Laertius, n.d., 8.1.12). Pausanias also clarifies that “*athletes had fed on cheese from the basket*” (Pausanias, n.d., 6.7.10). Philostratus (2nd C. AD) comments on the good health and longevity of the athletes as a result of adhering to a regimen based on barley and unleavened whole wheat bread, complemented, among other foods, with the meat of both domesticated and game animals (Philostratus, n.d., 43). As evidenced by the archive of Zenon of Kaunos (3rd C. BC), a patron of young athletes, among the foods considered to be particularly useful to the athletes was the carob (Zenon Papyri, n.d.. *Cair. Zen*, III. 59488) and honey (Zenon Papyri, n.d., *Lond.*, VII.1941), items rich in simple sugars, as well as the dry caper (Zenon Papyri, n.d., *S.I V*, 528), an item rich in quercetin, which has been reported to increase endurance exercise capacity. The earliest description about the athletic diet derived from Eusebius, who tells us about the Olympic athlete Charmis of Sparta who ate dried figs for his training purposes (Eusebius, n.d., p.197).

Eventually, many athletes seem to have focused on meat. Table 1 summarises the information on prominent features of the diets followed by Olympic winners, as extracted from classical sources. The philosopher Pythagoras, although a well-known advocate of meat abstinence, prescribed the athletes he supervised with regular meat consumption, therefore differentiating his approach from the one that had prevailed in previous times (Porphyry, n.d.a, 1.26):



“Pythagoras himself, though those prior to him permitted the athletes to drink milk, and to eat cheese, irrigated with water; but others, posterior to him, rejecting this diet, fed them with dry figs; yet he, abrogating the ancient custom, allowed them to feed on flesh, and found that such a diet greatly increased their strength”.

Table 1: Prominent components of the diets followed by ancient Olympic winners

Olympic organisation	Year	Olympic victor	Events*	Dietary component/s	Literary source
28 th	668 BC	Charmis of Laconia	Running Events	Dried Figs	Eusebius <i>Chronicle</i> p.197
60 th , 62 th -66 th	540, 532-516 BC	Milo of Croton	Heavy Events	Bread, Beef, Wine	Athenaeus <i>The Deipnosophists</i> 10.4
62 th	532 BC	Eurymenes of Samos	Heavy Events	Meat	Porphyry <i>Life of Pythagoras</i> 15
74 th -75 th	484-480 BC	Dromeus of Stymphalia	Running Events	Meat	Pausanias <i>Description of Greece</i> 6.7.10
75 th - 76 th	480-476 BC	Theagenes of Thasos	Heavy Events	Beef	Athenaeus <i>The Deipnosophists</i> 10.4
84 th	444 BC	Iccus of Taranto	Pentathlon	Sparse diet	Aelian <i>Various Histories</i> 11.3
93 th	408 BC	Polydamos of Skotoussa	Heavy Events	Beef	Plato <i>Republic</i> 1.338c-d
95 th	400 BC	Demanetus of Parrhasia	Heavy Events	Meat	Pliny The Elder <i>The Natural History</i> 8.34.22
114 th -123 th	328-296 BC	Herodorus of Megara	Special Events	Meat, Bread, Wine	Athenaeus <i>The Deipnosophists</i> 10.7

Running Events: Diaulos, Dolichos, Stadion, Hoplitodromia; *Heavy Events:* Boxing, Pankration, Wrestling; *Pentathlon:* Jump, Running, Discus, Javelin and Wrestling; *Special Events:* Trumpet concept.

Source: Devised by authors



Based on Porphyry's testimony, Eurymenes of Samos, who under Pythagoras' supervision won in the 62nd Olympiad (532 BC), was the first Olympic victor to have adopted a meat diet: "...while according to ancient custom the other athletes fed on cheese and figs, Eurymenes, by the advice of Pythagoras, fed daily on flesh, which endued his body with great strength" (Porphyry, n.d.b, 15). Reference to Eurymenes' meat-based diet is made also by Diogenes Laertius (Diogenes Laertius, n.d., 8.1.12). According to Pausanias, the first athlete who adopted a meat-based diet was not Eurymenes of Samos, but a runner contesting in *dolicho*, Dromeus of Stymphalia, who won two victories at Olympia, two at Delphi, three at the Isthmus and five at Nemea (Pausanias, n.d., 6.7.10). Plato mentions the example of Polydamas of Thessaly in order to illustrate the benefits one can enjoy by eating beef: "...if Polydamas the pancratiast is stronger than we are and the flesh of

beef is advantageous for him, for his body, this viand is also for us who are weaker than he both advantageous and just" (Plato, n.d.b, 1.338c-d).

The primary sources mention occasional as well as habitual practices of elite athletes consuming extremely large quantities of meat. Theagenes of Thasos, an Olympic winner in wrestling and pankration¹ (480 and 476 BC), once in Asia Minor and on the occasion of a bet, is said to have had a chance to devour an entire bull, a quantity he could not ever have access to in the deprived island of Thasos:

"And as I'd undertaken, I did eat a Thracian bull. My own poor native land of Thasos could not have purveyed a meal sufficient for the hunger of Theagenes. I ate all I could get, then asked for more. And, therefore, here you see, I stand in brass, holding my right hand forth put something in it" (Athenaeus, n.d., 10.4).

Milo, a renowned wrestler from Kroton who won in the Olympic Games six times (540 BC, 532-516 BC), became known for the anecdotal quantities of meat he was able to devour. According to Athenaeus, Milo "ate twenty choenixes of meat, and an equal quantity of bread, and drank three choes of wine" (Athenaeus, n.d., 10.4). Milo was trained under the supervision of Pythagoras of Samos, the philosopher and mathematician who had settled in South Italy; as already mentioned, he also supervised Eurymenes of Samos. Pythagoras' innovative method for the dietary support of his athletes, which provided large quantities of meat, may have served as a paradigm for subsequent trainers who revised their approach about athletic preparation. Titormus the Aetolian had a contest with Milo as to which of the two could devour an ox with the greatest speed (Athenaeus, n.d., 10.4). The reputation of Milo and the other athletes' of the 5th and 6th century BC across the Greek world

was great and must have influenced the practices of subsequent athletes.

An athlete who excelled in ten consequent Olympic Games (328 to 292 B.C.) was the trumpeter Herodorus of Megara. Julius Pollux wrote that he subsisted on very large quantities of food, including meat, that permitted him to maintain the extraordinary strength of his lungs (Pollux, n.d., 4.89). Athenaeus refers to Herodorus who "could eat six choenixes of bread, and twenty liters of meat, of whatever sort was provided for him, and he could drink two choes of wine and that he could play on two trumpets at once" (Athenaeus, n.d., 10.7). Athenaeus refers to a female athlete as well, the trumpeter Aglais, who consumed "twelve liters of meat and four choenixes of bread, and drink a choeus of wine, at one sitting" (Athenaeus, n.d., 10.4). Finally, the historian Pliny the Elder (1st C. AD) connected the athletic achievement of the

¹ Pankration was a sporting event that combined techniques of both wrestling and boxing; it was introduced into the ancient Olympic Games in 648 BC.

Olympic victor Demanetus the Parrhasian with the myth of men consuming human flesh during the ceremonies performed at the Mount Lykaion as part of the religious worships that regularly took place on the mountain (Pliny The Elder, n.d., 8.34.22).

Archaeological evidence can be used to cross-validate the data derived from the literature sources on the use of meat by elite athletes in antiquity. In paleoanthropological analyses, findings such as the good condition of tooth enamel and the absence of cavities are indicative of a diet containing meat. Data derived from the skeleton of the so-called Athlete of Taranto, discovered in Taranto of South Italy, indicate that, in fact, this athlete followed an animal-based diet that also contained considerable amounts of seafood (Baggeri and di Giacomo, 2002) “...near waters, as the latter used to subsist on sea garlic and crabs” (Philostratus, n.d., p.44).



Criticism on the Behaviour of Elite Athletes

The above described practices greatly differentiate ancient athletes from the other citizens, who, typically, consumed meat occasionally. It is well documented that in ancient Greece animal slaughtering was performed in a ritual manner, during religious sacrifices. Being a sacrificed food item, meat was eaten sparingly, mainly during religious festivals and other special circumstances. In support of this argument, one should also consider the wide-spread belief in antiquity that animal herders were of superior physical strength compared to other citizens as a result of eating meat more frequently (Dalby, 1996).

Critique on the excesses in which athletes engaged was a common discourse in ancient literature. Excessive meat consumption is the prime issue of the criticism (Athenaeus, n.d., 10.4). It is said that the cynic philosopher Diogenes mocked the athletes as being “*stupid, because they are built up of pork and beef*” (Diogenes Laertius, n.d., 6.2.49). Galen stigmatised intensive feeding in that it destroys the beauty (*kallos*) of the athlete, by rendering the body disproportionate in shape and by distorting facial characteristics (Galen, n.d.c, p.12). The Hippocratics pointed out that the benefits of meat consumption are transient:

“ ... and in bodies of such a sort a good condition is at its best only for a while [while, in the long-run] meat-eating predisposes to this kind of diarrhoea which attacks mostly persons of close flesh, when a man of such a constitution is compelled to eat meat, for the veins when closely contracted cannot take in the food that enters... [A person who subsists on meat] is apt sharply to turn in either direction, to the good or to the bad” (Hippocrates, n.d.b, p.7).

Additionally, Plato praised the athletes who were able to abstain from excesses and exhibit self-restraint. He named individual athletes (Crison of Himera, Astylus of Croton, Diopompus of Thessaly and Iccus of Taranto) whose wise behaviour ought to become a paradigm for the other athletes (Plato, n.d.a, 8.840a). Aelian commented on the behaviour of Iccus of Taranto, an Olympic victor in pentathlon during the 84th

Games (444 BC): “*Iccus the Tarentine used wrestling, and in the time of his exercise continued most temperate, using spare diet, and living continently all his time*” (Aelian, n.d., 11.3). Frugality in diet was practiced by some other athletes, such as the wrestler Gerinos of Nafkratis (Philostratus, n.d., p.54) and the boxer Melancomas of Caria. For the latter, it is said that he:

“ ... remained undefeated not only by his opponents but also by toil and heat and gluttony and sensuality; for the man who is going to prove inferior to none of his opponents must first be undefeated by these things” (Dio Chrysostom, n.d., 28.12).



Galen

Discussion

For both ancient physicians and their audiences, food intake and exercise were treated as interrelated elements, equally critical within the art of medicine. The data presented above suggest that ancient doctors basically accepted the notion that the stereotypic country-type diet (plant-based) was not capable of supporting the needs of many of the athletes: the nutrition of elite athletes greatly diverged from the diet of country folk.

On some occasions, elite athletes appear to have followed specific guidelines that were tailored to the needs of their individual athletic event. Overall, the ancients acknowledged the fact that a diet that includes animal-origin foods is superior to a vegetable-based diet when it comes to sustaining muscular mass.

It is noteworthy that even the followers of the School of Pythagoras, known for advocating abstinence from animal food, made an exception when it came to athletic nutrition. The kind of meat that should be consumed by the athlete was scrutinised. However, philosophers and doctors often exerted stern critique on the athletes' extreme behaviour and, particularly, their reliance on meat. As Wilkins and Hill (2006, p.193) pointed out, ancient *"doctors were influenced by philosophers and philosophers by doctors"*.

The evidence presented above suggests that Olympic winners contesting in strength events (boxing and wrestling) ate large quantities of meat, often on a daily basis. It was even held that just a day's abstinence from meat would be of detriment to the athlete's strength capacity. The experts' opinion on this issue was refined enough to take into account the specifics of the various

events and stages of training. Therefore, beef was considered by the Hippocratic doctors as the most suitable when strength performance was required, while goat meat, being leaner, was the meat of choice if one wished to preserve the muscular system in good condition; it was also good for recovery. On the other hand, pork, although generally acknowledged as being inferior in terms of concoction (digestibility), was viewed as a meat suitable to help heavyweights to last long hours of contest in heavy events. In addition to species, the animal's age and specifics of its diet were also viewed as attributes that influenced the meat's suitability in supporting athletic performance.

Data on the diets of Olympic athletes, both ancient and modern, remain limited.

To the best of our knowledge, this is the first study to examine the work of ancient physicians aiming to reveal their views on the particularities of athletes' nutrition. The main limitation of the study stems from the fact that the material derived from ancient literary sources is fragmentary and difficult to interpret. A second limitation

is its time-span, which exceeds

that of a millennium (the period began in the archaic era, when the introduction of the Olympic Games is placed, and ended in Roman times, when the Olympic Games ceased). The authors consulted the work of prominent scholars in the field in order to critically evaluate the original passages and cross-validate ambiguities in the information derived from the literature. Future research, not only with literary sources, but also with archaeological findings, could provide useful data in order to advance our understanding and knowledge on athletic nutrition over time.



Modern science has thoroughly studied many of the aspects related to physical performance; however, a great deal remains to be elucidated, particularly with the application of metabolomics. In this context, a top-to-bottom approach can be useful when attempting to integrate the experimental evidence. The present findings of the systematic examination of the diets adopted by elite competitors may contribute to our understanding of how relevant views have evolved during the history of the Olympic Games.

Parallels between modern era sciences and antiquity science with respect to athletic nutrition can be identified (Table 2). In summary, ancient and modern science share the same goal, i.e., to provide enough energy for the athlete to compete and, at the same time, maintain his good health. Although the epistemological approach (top-

bottom in antiquity vs. bottom-up in modern science) and the level of detail differ, in both cases athletic diets comprise of foods deemed adequate for maintaining a good physique while achieving optimal performance. In addition, ancient and modern trainers alike acknowledged the fact that muscle growth and strength offers a great advantage in the pursuit of victory and, therefore, differentiated between the endurance/running events and the strength/heavy events in forming their recommendations for the athlete. In that respect, however, ancient athletes relied on animal food for protein intake and muscular growth while modern athletes have access to enhanced protein formulas. The absence of weight divisions in ancient Olympics contributes to this divergence, as trainers strived to make a difference in their athletes' strength regardless of their body mass.

Table 2: Perspectives of athletic nutrition compared: Modern era sciences vs. antiquity science

	ANTIQUITY	MODERN ERA
Epistemological approach	Holistic approach (top-bottom)	Reductionist approach (bottom-up)
Context	Lifestyle context	Food-intake context
Level of detail	At the food level Emphasis on food quality and origin	At the nutrient level Emphasis on macronutrient ratio and micronutrient content
Goals of dietary management	Good physical condition Maximum athletic performance	Good physical condition Maximum athletic performance
Consideration for variable sport requirements	Yes Discrimination between runs and «heavy» exercise	Yes Discrimination between endurance and strength exercise
Differentiation according to athletes body mass	No	Yes, division by body weight

Source: Devised by authors

Public Health Significance

The significance of exercise in maintaining health and preventing disease has been established by modern science in recent years. The present study reveals how, in the treatises of ancient physicians, the term «diet» did not refer to food intake alone, but to habitual food and exercise patterns. Our findings also add to the existing evidence that training for the Olympic Games has been practiced not only as a science but also as a kind of art since the very beginning of the Games. The training of elite athletes has been an engaging task to which physicians and sports experts were expected to contribute. In line with the situation today, serious debates were held among experts in regards to the training methods applied and the guidelines provided to ancient elite athletes.



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