Dietary supplement

SHAPE CODE® Protein Shake

SHAPE CODE® Protein Shake is a dietary supplement in the form of a protein powder shake containing three types of lactose-free whey protein*: whey protein concentrate (WPC), whey protein isolate (WPI) and whey protein hydrolysate (WPH), as well as clinically documented ingredients - Palatinose™ and WATTS'UP®**.

When?

Protein is a valuable building material for nervous and glandular tissue, is included in body fluids and secretions such as blood, enzymes, hormones, and participates in important regulatory and transport processes[1].

Protein is also one of the basic elements of the diet - especially for people who play sports. In people who regularly train at the gym, the demand for protein increases. In people who are primarily concerned about developing more muscle mass, protein is the building block from which the body can synthesize proteins and build muscle. In people who are thinking more about weight loss, protein helps prevent excessive muscle tissue loss and promotes the reduction of hunger[2, 3].

When and whether to supplement protein at all depends largely on what our diet is like. A well-calculated energy balance is the basis for shaping our figure. However, we know well ourselves that this is not always possible. This is where protein supplements come to the rescue to supplement caloric needs.

How?

The dietary supplement **SHAPE CODE® Protein Shake** has the form of a protein shake powder with vanilla and cream flavor. It is intended to be used as a supporting preparation for those who:

- for various reasons, do not have the required amount of protein in their daily diet (meals);
- practice strength, figure, endurance, and speed sports;
- wish to maintain a proper body weight;
- keep normal blood cholesterol level;
- have digestive problems (e.g. meat and egg intolerance);
- have sustained muscle and bone injuries;
- are overweight.

SHAPE CODE® Protein Shake supports:

- the process of building lean muscle mass;
- body weight control;
- body fat burning;
- metabolic processes;
- post-workout regeneration;
- normal blood cholesterol level;
- recovery after muscle and bone injuries;
- optimal efficiency of exercises;

*** WATTS'UP® is a trademark of BioActor B.V.*

- the reduction of muscle protein catabolism;
- weight loss (helps provide the feeling of satiety).

SHAPE CODE® Protein Shake – how to use:
Add two flat scoops of the powder (35 g in total) to 200 ml of **cool water or your favourite plant drink,** and shake vigorously to prevent the contents from settling to the bottom. Drink your shake with vanilla and cream flavour 1 to 2 times a day. The use immediately after workout is recommended. Do not exceed the recommended daily intake. The product cannot be used as a substitute for a varied diet. Use the shake as part of a balanced and varied diet combined with an active lifestyle.

Remember:
SHAPE CODE® Protein Shake is prepared with WATER or **PLANT DRINK.**

SHAPE CODE® Protein Shake can be combined with the following products:
DuoLife Medical Formula ProStik® and DuoLife Collagen.

Ingredients: Lactose-free whey protein blend*: WPC - whey protein concentrate (from **milk**), WPI – whey protein isolate (from **milk**), WPH – whey protein hydrolysate (from **milk**), isomaltulose (Palatinose™) – sweetener of natural origin, natural cream flavour, natural vanilla flavor, salt, WATTS'UP®** – a proprietary sweet orange fruit (*Citrus sinensis*) formula standardized for hesperidin, stevia (steviol glycosides) - a natural sweetener.

* Lactose content <0,01 g/100 ml of finished product prepared with water or plant drink.

NUTRITIONAL VALUE *Number of portions in a package: 20*

	For 35 g of powder (1 portion)	**For 70 g of powder** (2 portions)	**For 100 g of powder**
Energy content	133 kcal/558 kJ	266 kcal/1116 kJ	380 kcal/1593 kJ
Fat, of which:	1.5 g	3 g	4.2 g
saturated fatty acids	0.9 g	1.8 g	2.5 g
Carbohydrate, of which:	5.8 g	11.6 g	16.6 g
sugars	1.5 g	3 g	4.35 g
Protein	24.2 g	48.3 g	69 g
Salt	0.21 g	0.42 g	0.6 g

ADDITIONAL INFORMATION

	For 35 g of powder (1 portion)	**For 70 g of powder** (2 portions)	**For 100 g of powder**
WATTS'UP®** – a proprietary sweet orange fruit (*Citrus sinensis*)	200 mg	400 mg	571 mg
Including hesperidin	180 mg	360 mg	514 mg
isomaltulose (Palatinose™)	4.2 g	8.4 g	12 g
Branched-chain amino acids, BCAAs	5.6 g	11.2 g	16 g

*** WATTS'UP® is a trademark of BioActor B.V.*

What is WATTS'UP®**?

WATTS'UP®** is a proprietary formula of all-natural *Citrus sinensis* sweet orange fruit extract standardised for hesperidin in its most active conformation. It is produced from sweet orange fruit in a proprietary gentle extraction process without any auxiliary substances. The formula has **clinically proven** effects on exercise performance in moderately trained individuals[4, 5]. The proprietary formula was clinically tested to the gold standard of randomised, double-blind, placebo-controlled studies.

A daily dose of WATTS'UP® used in clinical trials (400 mg) is contained in 2 portions (70 g) of SHAPE CODE® Protein Shake.**

The primary objective of the clinical trial, the results of which were published in 2021 (ClinicalTrials.gov: NCT03044444), **was to evaluate the effect of a 400 mg dose of WATTS'UP®*at peak power output during the Wingate Cycle Test conducted in moderately physically active individuals.** Ninety-two subjects (men and women) participated in the study: 30 subjects took 400 mg of WATTS'UP®** per day orally, 31 subjects took 500 mg of WATTS'UP®**, and 31 subjects took 500 mg of maltodextrin per day (as placebo). The study lasted 8 weeks. At baseline, the Wingate's anaerobic test*** was performed and this measurement was repeated after 4 and after 8 weeks[4].

***Wingate's anaerobic test –** is widely used to measure anaerobic power, and was conducted on a Wattbike Pro (Wattbike Ltd, Nottingham, UK). The Wattbike resistance system was equipped with an air resistance flywheel with a shift lever adjustable from 1 (low) to 10 (high). The tests were performed at the High-Performance Center at TopSport Limburg in Sittard.

The Wingate anaerobic test showed increased mean anaerobic power in the group taking 400 mg WATTS'UP®**, which was significantly different (***p<0.001) compared to the placebo group (*Figure 1*).

Furthermore, peak strength during the first 5 seconds of exercise was shown to significantly increase after 4 weeks of supplementation with 400 mg of WATTS'UP®** compared to placebo (p*=0.020), corresponding to a 7.5% increase (*Figure 2*)[4].

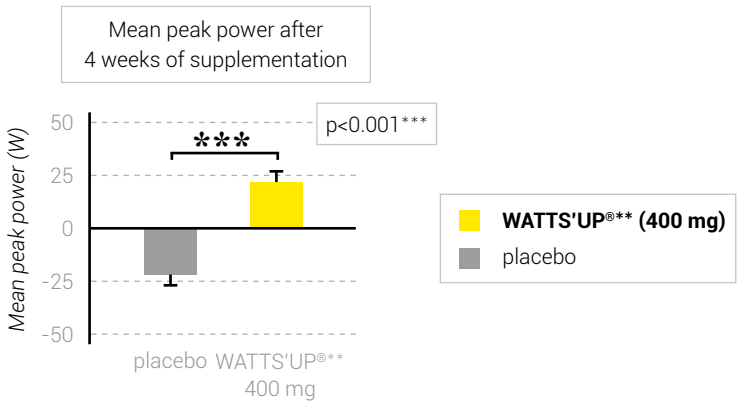

Figure 1: Effect of 4-week WATTS'UP®** supplementation on mean peak power. Based on [1].

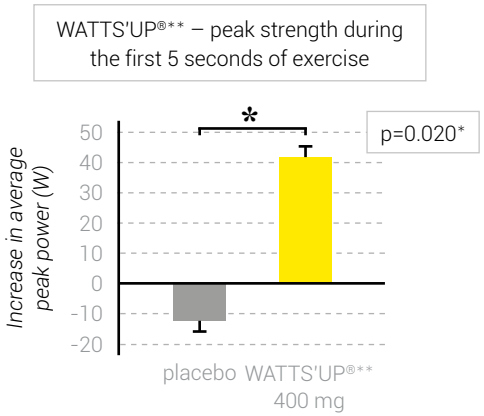

Figure 2: Peak power increase during the first five seconds of activity. Based on [1].

Why is protein important in our diet?

Protein is one of the three primary macronutrients in the diet (along with fat and carbohydrates)[1].

Proteins that provide an adequate supply of all essential amino acids are called **complete proteins.** This group includes proteins found in animal products such as eggs, meat from slaughtered animals, poultry, fish, and dairy products[6].

*** WATTS'UP® is a trademark of BioActor B.V.*

It is considered safe to consume even twice as much protein as is recommended at the RDA standard level **(0.9 grams of protein per kilogram of body weight).** This means that 15% to 25% of daily energy intake come from protein. However, protein intake can also be above or below this range as it depends on age, gender and level of physical activity[1].

Whey protein is a complete, high-quality protein that contains all the essential amino acids. Moreover, it is very easily digestible and rapidly absorbed from the intestines compared to other types of protein[7]. This makes it one of the best sources of protein.

A number of clinical studies confirm the beneficial effects of whey protein for people who regularly exercise[8–11]. Strength training combined with the consumption of high-protein foods or protein supplements has been shown to promote the building of muscle mass[12]. High-quality protein sources, such as whey rich in **branched-chain amino acids** (BCAAs), including valine, leucine, and isoleucine, are particularly effective. These amino acids are used by the body for muscle protein synthesis. Additionally, due to its properties, leucine controls the synthesis processes, promoting lean muscle growth. BCAAs are also involved in glycaemic control and carbohydrate metabolism, reducing post-workout muscle fatigue.

In terms of lean muscle mass building, whey protein has been shown to be a slightly better choice compared to other types of protein, such as casein or soy[13–15]. A study published in the *International Journal of Sport Nutrition and Exercise Metabolism* found that "whey protein supplementation during resistance training provides some benefits over resistance training alone." Furthermore, "men who supplemented with whey protein demonstrated greater relative gains in lean tissue"[2].

Moreover, increased protein intake is a well-known strategy to support weight loss[16–18].

More protein intake can promote fat loss by:
- Suppression of appetite, leading to reduced calorie intake[3].
- Increasing metabolism, helping you burn more calories[19, 20].
- Support in maintaining muscle mass during weight loss[21].

Whey protein has been shown to be particularly effective and may have a better effect on fat burning and the feeling of satiety compared to other types of protein[22–26].

Shape Code Protein Shake uses 3 types of lactose-free whey protein: concentrate (WPC), isolate (WPI) and hydrolysate (WPH).

What is the difference between WPC, WPH and WPI proteins?

There are three main types of whey protein powders: **concentrate (WPC), isolate (WPI) and hydrolysate (WPH).**

WPC (*whey protein concentrate*):
- WPC digestion begins **ABOUT ONE HOUR** after consumption and **LASTS ROUGHLY ANOTHER TWO HOURS.**
- It contains up to 80% protein by weight. The remaining 20% of the whey concentrate powder contains carbohydrates and fats.
- Concentrates work best for those who do amateur training or just begin their adventure with protein supplements.
- It contains large amounts of essential amino acids necessary for muscle growth[7].
- It can be used as a daily protein supplement.
- It is recommended to consume it between meals, after training, or before bed.

WPI (*whey protein isolate*):
- WPI digestion begins **ABOUT ONE HOUR AFTER CONSUMPTION, but the absorption time is about half that of WPC.**
- Its production is based on even more thorough filtration (ultrafiltration and microfiltration) than in WPC, and thus the amount of protein in it reaches up to 95%. Thanks to the high protein concentration, the isolate contains even more essential amino acids than the concentrate.

- As WPI is absorbed quickly, it is not recommended for use at night.
- WPI has a high *biological value* (BV) and is therefore efficiently digested.

WPH (*whey protein hydrolizate*):

- Its effective digestion starts virtually **IMMEDIATELY AFTER CONSUMPTION** and lasts **FOR JUST ONE HOUR.** During this time, muscles receive a dose of nutrients which can significantly improve their regeneration after training.
- It is considered a „pre-digested" form of whey protein because it has already undergone partial hydrolysis, a process necessary for the body to absorb protein. WPH does not have to be as intensively digested as the other two forms of whey protein.
- The whey protein contained in WPH is best absorbed and its content in the pure product is 100%.
- WPHs are best for stimulating muscle growth and have a very fast absorption.
- This type of protein is especially recommended for those who want to build muscle mass and significantly reduce body fat levels.

Similarly to WPC and WPI, it should be a supplement and a way replenish protein deficiency.

Comprehensive supplementation of WPC, WPH and WPI proteins is valuable for the body.

The combination of three types of whey proteins in the **SHAPE CODE® Protein Shake** supplement creates many interesting possibilities for physically active people. Thanks to various protein fractions, the product can be used virtually at any time of day, **ALTHOUGH AFTER TRAINING IS THE BEST TIME.** After intake of the protein mixture contained in **SHAPE CODE® Protein Shake**, the body can remain in the anabolic state even for several hours. This is due to different kinetics of digestion and absorption of particular protein fractions. The continuous flow of amino acids obtained with the blend also means faster regeneration, prevention of muscle tissue breakdown, and support for immune functions. With the synergistic effect of 3 types of proteins, **SHAPE CODE® Protein Shake** works perfectly for both professionals and those who do exercise for recreational purposes (*Figure 3*).

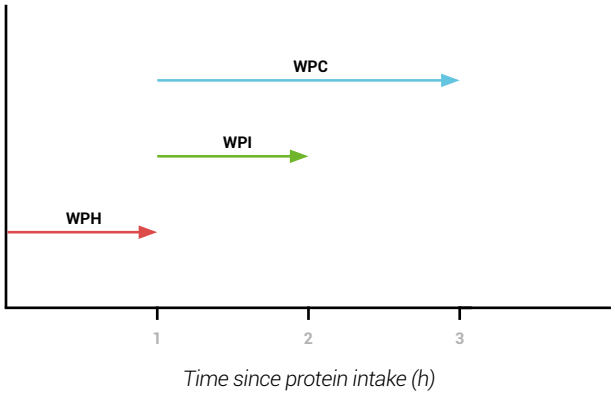

Figure 3: Beneficial synergistic effects of a mixture of 3 types of whey protein – optimal supply up to 3 h after training.

Palatinose™ (isomaltulose) is a sweetener that is especially valuable for people who practice sports.

Palatinose™ is a naturally-derived carbohydrate often referred to as a „smart" carbohydrate that delivers energy in a more sustainable way compared to other sweeteners due to its extremely low glycaemic index. An interesting feature is that it is the first carbohydrate that does not cause tooth decay[27].

Palatinose™ occurs naturally in honey and cane sugar and has a slower energy release compared to sucrose. Palatinose™ is digested much more slowly (than sucrose or maltose) by small intestinal enzymes, and due to its slow but complete release in the intestine, it fully provides carbohydrate energy (4 kcal/g) in a more balanced way and for a longer period of time. This notwithstanding, it provides the same amount of carbohydrate energy as sucrose (*Figure 4*).

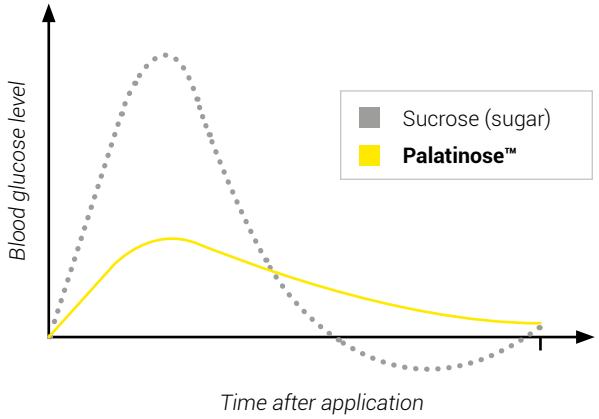

Figure 4: Comparison of carbohydrate energy release rates for sucrose (sugar) and Palatinose™.

This property translates into the fact that **the body will be supported energetically during exercise in a slower, steady and prolonged manner.**

Clinical studies[28] suggest that Palatinose™ also promotes optimal fat release from tissues, may support exercise performance and also supports optimal blood glucose levels.

Stevia is another valuable sweetener used in SHAPE CODE® Protein Shake.

Steviol glycosides are a completely natural sweetener, have **zero calorific value** and are not absorbed in the human digestive tract[29]. Stevia **shows many pro-health properties,** such as lowering blood pressure[30]. Scientific research has shown that stevia can be safely used in the daily diet. There is no doubt that bringing stevia to the Polish food market is **the first step towards changing bad dietary habits** associated with the overuse of sugar in the everyday diet[31].

What makes SHAPE CODE® Protein Shake different?

- **Ingredients with clinical studies - Palatinose™ and WATTS'UP®**** clinically proven to promote increased power and performance during physical activity.
- **It contains as many as three types of whey protein: WPC, WPI and WPH.**
- Product **DOES NOT CONTAIN lactose** (35 g of powder dissolved in 200 ml of water contains <0.01 g of lactose per 100 ml of product).
- **100% of the ingredients are of natural origin.**
- Product **DOES NOT contain gluten or soy.**
- **Product DOES NOT CONTAIN preservatives, artificial colourants, sweeteners, flavours, artificial fillers and IS GMO FREE –** the raw materials used to develop the supplement ARE NOT DERIVED from genetically modified plants and animals fed with genetically modified feed.
- It is suitable for consumption by people with lactose intolerance.
- It is suitable for consumption **by vegetarians.**

SHAPE CODE® Protein Shake is available in:

- **700 g PACKS** containing **20 PORTIONS IN ONE PACK** – **SHAPE CODE® Protein Shake 700 g.**
- **35 g SINGLE PORTIONS** that you can easily take to the gym or on a trip – **SHAPE CODE® Protein Shake 35 g.**

The SHAPE CODE® Protein Shake references can be found on a separate binder sheet.

*** WATTS'UP® is a trademark of BioActor B.V.*

SHAPE CODE® Protein Shake

References

1. Gawędzki, J., & Hryniewiecki, L. (2010). Żywienie człowieka. Podstawy nauki o żywieniu. *Wydawnictwo Naukowe PWN, Wydanie III, Warszawa.*
2. Burke, D. G., Chilibeck, P. D., Davison, K. S., Candow, D. C., Farthing, J., & Smith-Palmer, T. (2001). The effect of whey protein supplementation with and without creatine monohydrate combined with resistance training on lean tissue mass and muscle strength. *International journal of sport nutrition and exercise metabolism, 11*(3), 349-364.
3. Paddon-Jones, D., Westman, E., Mattes, R. D., Wolfe, R. R., Astrup, A., & Westerterp-Plantenga, M. (2008). Protein, weight management, and satiety. *The American journal of clinical nutrition, 87*(5), 1558S-1561S.
4. van Iersel, L. E., Stevens, Y. R., Conchillo, J. M., & Troost, F. J. (2021). The effect of citrus flavonoid extract supplementation on anaerobic capacity in moderately trained athletes: a randomized controlled trial. *Journal of the International Society of Sports Nutrition, 18*(1), 1-10.
5. Overdevest, E., Wouters, J. A., Wolfs, K. H., van Leeuwen, J. J., & Possemiers, S. (2018). Citrus flavonoid supplementation improves exercise performance in trained athletes. *Journal of sports science & medicine*, 17(1), 24.
6. Deutz, N. E., Bauer, J. M., Barazzoni, R., Biolo, G., Boirie, Y., Bosy-Westphal, A., ... & Calder, P. C. (2014). Protein intake and exercise for optimal muscle function with aging: recommendations from the ESPEN Expert Group. *Clinical nutrition, 33*(6), 929-936.
7. Boirie, Y., Dangin, M., Gachon, P., Vasson, M. P., Maubois, J. L., & Beaufrère, B. (1997). Slow and fast dietary proteins differently modulate postprandial protein accretion. *Proceedings of the National Academy of Sciences, 94*(26), 14930-14935.
8. Naclerio, F., & Larumbe-Zabala, E. (2016). Effects of whey protein alone or as part of a multi-ingredient formulation on strength, fat-free mass, or lean body mass in resistance-trained individuals: a meta-analysis. *Sports Medicine, 46*(1), 125-137.
9. Campbell, B., Kreider, R. B., Ziegenfuss, T., La Bounty, P., Roberts, M., Burke, D., ... & Antonio, J. (2007). International Society of Sports Nutrition position stand: protein and exercise. *Journal of the international society of sports nutrition, 4*(1), 1-7.
10. Miller, P. E., Alexander, D. D., & Perez, V. (2014). Effects of whey protein and resistance exercise on body composition: a meta-analysis of randomized controlled trials. *Journal of the American College of Nutrition, 33*(2), 163-175.
11. Morton, R. W., Murphy, K. T., McKellar, S. R., Schoenfeld, B. J., Henselmans, M., Helms, E., ... & Phillips, S. M. (2018). A systematic review, meta-analysis and meta-regression of the effect of protein supplementation on resistance training-induced gains in muscle mass and strength in healthy adults. *British journal of sports medicine, 52*(6), 376-384.
12. Paddon-Jones, D., & Rasmussen, B. B. (2009). Dietary protein recommendations and the prevention of sarcopenia: protein, amino acid metabolism and therapy. *Current opinion in clinical nutrition and metabolic care, 12*(1), 86.
13. Pennings, B., Boirie, Y., Senden, J. M., Gijsen, A. P., Kuipers, H., & van Loon, L. J. (2011). Whey protein stimulates postprandial muscle protein accretion more effectively than do casein and casein hydrolysate in older men. *The American journal of clinical nutrition, 93*(5), 997-1005.
14. Tang, J. E., Moore, D. R., Kujbida, G. W., Tarnopolsky, M. A., & Phillips, S. M. (2009). Ingestion of whey hydrolysate, casein, or soy protein isolate: effects on mixed muscle protein synthesis at rest and following resistance exercise in young men. *Journal of applied physiology.*
15. Hartman, J. W., Tang, J. E., Wilkinson, S. B., Tarnopolsky, M. A., Lawrence, R. L., Fullerton, A. V., & Phillips, S. M. (2007). Consumption of fat-free fluid milk after resistance exercise promotes greater lean mass accretion than does consumption of soy or carbohydrate in young, novice, male weightlifters. *The American journal of clinical nutrition, 86*(2), 373-381.
16. Westerterp-Plantenga, M. S., Nieuwenhuizen, A., Tome, D., Soenen, S., & Westerterp, K. R. (2009). Dietary protein, weight loss, and weight maintenance. *Annual review of nutrition, 29*, 21-41.
17. Noakes, M., Keogh, J. B., Foster, P. R., & Clifton, P. M. (2005). Effect of an energy-restricted, high-protein, low-fat diet relative to a conventional high-carbohydrate, low-fat diet on weight loss, body composition, nutritional status, and markers of cardiovascular health in obese women. *The American journal of clinical nutrition, 81*(6), 1298-1306.
18. Krieger, J. W., Sitren, H. S., Daniels, M. J., & Langkamp-Henken, B. (2006). Effects of variation in protein and carbohydrate intake on body mass and composition during energy restriction: a meta-regression. *The American journal of clinical nutrition, 83*(2), 260-274.
19. Johnston, C. S., Day, C. S., & Swan, P. D. (2002). Postprandial thermogenesis is increased 100% on a high-protein, low-fat diet versus a high-carbohydrate, low-fat diet in healthy, young women. *Journal of the American College of Nutrition, 21*(1), 55-61.

20. Veldhorst, M. A., Westerterp-Plantenga, M. S., & Westerterp, K. R. (2009). Gluconeogenesis and energy expenditure after a high-protein, carbohydrate-free diet. *The American journal of clinical nutrition, 90*(3), 519-526.
21. Frestedt, J. L., Zenk, J. L., Kuskowski, M. A., Ward, L. S., & Bastian, E. D. (2008). A whey-protein supplement increases fat loss and spares lean muscle in obese subjects: a randomized human clinical study. *Nutrition & metabolism, 5*(1), 1-7.
22. Pal, S., & Ellis, V. (2010). The chronic effects of whey proteins on blood pressure, vascular function, and inflammatory markers in overweight individuals. *Obesity, 18*(7), 1354-1359.
23. Pal, S., Radavelli-Bagatini, S., Hagger, M., & Ellis, V. (2014). Comparative effects of whey and casein proteins on satiety in overweight and obese individuals: a randomized controlled trial. *European journal of clinical nutrition, 68*(9), 980-986.
24. Veldhorst, M. A., Nieuwenhuizen, A. G., Hochstenbach-Waelen, A., van Vught, A. J., Westerterp, K. R., Engelen, M. P., ... & Westerterp-Plantenga, M. S. (2009). Dose-dependent satiating effect of whey relative to casein or soy. *Physiology & behavior, 96*(4-5), 675-682.
25. Bendtsen, L. Q., Lorenzen, J. K., Gomes, S., Liaset, B., Holst, J. J., Ritz, C., ... & Astrup, A. (2014). Effects of hydrolysed casein, intact casein and intact whey protein on energy expenditure and appetite regulation: a randomised, controlled, cross-over study. *British journal of nutrition, 112*(8), 1412-1422.
26. Baer, D. J., Stote, K. S., Paul, D. R., Harris, G. K., Rumpler, W. V., & Clevidence, B. A. (2011). Whey protein but not soy protein supplementation alters body weight and composition in free-living overweight and obese adults. *The Journal of nutrition, 141*(8), 1489-1494.
27. Shyam, S., Ramadas, A., & Chang, S. K. (2018). Isomaltulose: Recent evidence for health benefits. *Journal of Functional Foods, 48*, 173-178.
28. König, D., Zdzieblik, D., Holz, A., Theis, S., & Gollhofer, A. (2016). Substrate utilization and cycling performance following Palatinose™ ingestion: a randomized, double-blind, controlled trial. *Nutrients, 8*(7), 390.
29. Brusick, D. J. (2008). A critical review of the genetic toxicity of steviol and steviol glycosides. *Food and Chemical Toxicology, 46*(7), S83-S91.
30. Carakostas, M. C., Curry, L. L., Boileau, A. C., & Brusick, D. J. (2008). Overview: the history, technical function and safety of rebaudioside A, a naturally occurring steviol glycoside, for use in food and beverages. *Food and Chemical Toxicology, 46*(7), S1-S10.
31. Gęsiński, K., Majcherczak, E., & Gozdecka, G. (2013). Stewia (Stevia rebaudiana Bertoni) jako źródło wybranych mikroelementów. *Inżynieria i Aparatura Chemiczna, 53*(2).