Protein shakes

If you train heavily, particularly in the gym, it is important not to overlook nutrition. *Consumer Choice* looks at dietary sources of protein and whether protein shakes are necessary.

AT A **GLANCE**

Protein powder.

Brands examined.

Dietary sources.

Protein is made up of amino acids which are needed by the body to build, repair and maintain muscle tissue, and to make vital enzymes. Of the 20 that have been identified, there are eight 'essential' amino acids which the body cannot manufacture and therefore they must be obtained from food. Resistance training and endurance workouts can break down muscle and protein is required to fuel repair and growth. Most balanced diets, including those of vegetarians and vegans, should get a sufficient daily intake of protein from animal and plant sources (see p180). However, many people who train or exercise regularly choose to supplement their protein intake, or substitute some meals with protein shakes.

There are many varieties on the market but there are basically two main types of protein drink available. These are weight gain drinks, which have a high carbohydrate and calorie content, and protein drinks which contain less carbohydrate and are used by people who want to increase lean muscle mass from fewer calories.

Brands examined

Protein powders and supplements have long been used in conjunction with weight training and other strength exercises in the attempt to bulk up and build body strength. There is no shortage of dietary supplement companies selling protein supplements in a range of prices and flavours. Such products are readily available in gyms, health food stores and from internet websites. Protein powder is based on whey, casein, egg, soy or rice and is usually reconstituted into a liquid shake by adding fruit juice, water or milk. Manufacturers often make impressive claims about their products' ability to increase bulk. Although research has shown that some do what their advertising says, it is important to examine the label before you purchase, searching in particular for scientific evidence to support any claims made.

Make sure to check which products give the most protein per 100g as opposed to 'per serving'. This figure fluctuated between 40g and 92g per 100g in the brands *Consumer Choice* looked at (see table). It pays to shop around because we found that prices also fluctuate. For example 1.2kg of Maximuscle Cyclone costs €56.99 in Health Matters in Dublin 2 whereas the same product costs €63.00 in Boots; a difference of €6. Most of the ingredient lists we looked at were very long and would require scientific knowledge to interpret, but consumers can always watch out for additives, artificial flavourings and colourings, bulking agents, added sugars and sulphites. Many protein supplements contain additives that have no health benefits

PROTEIN SHAKES COMPARED

Product	Shop	Size (kg)	Price (€)	Price per kg (€)	Protein content per 100g	Protein source
Educohealth Proform Strawberry	Tony Quinn	1	42.00	42.00	91.68	Casein
Nutrisport Pea Protein Isolate 90+	Nourish	0.908	23.65	26.05	90.2	Pea
Holland & Barrett Pure Soya Protein Isolate Powder	Holland & Barrett	0.908	15.25	16.80	87.1	Soy
Nutrisport Vanilla/Strawberry/Chocolate	Health Matters	0.908	26.95	29.68	86	Whey/ Casein
Nutrisport Whey Protein Isolate	Health Matters	1	37.00	37.00	86	Whey
Maximuscle High Protein Promax Extreme Strawberry/Vanilla/Orange	Health Matters	0.908	56.99	62.76	85	Whey
Maximuscle High Protein Promax Extreme Chocolate	Argos	0.908	58.99	64.97	85	Whey
ProX The Ultimate Protein Chocolate/Banana/Vanilla/Strawberry	Health Matters	1.816	49.99	28.57	83.8	Whey
Maximuscle High Protein Promax Strawberry	Boots	0.454	26.45	45.45	81	Whey
Maximuscle High Protein Promax Strawberry	Argos	0.908	45.99	50.65	81	Whey
Maximuscle High Protein Promax Strawberry	Tony Quinn	0.908	46.50	51.21	81	Whey
Solgar Whey to Go	Nourish	0.907	75.95	83.55	80	Whey
Natural Body Fortress Whey Protein Vanilla	Holland & Barrett	0.908	76.15	38.99	76.15	Whey
Body Fortress Whey Protein	Holland & Barrett	0.908	38.99	42.94	74.3	Whey
Maximuscle Promax Diet Protein Shake Chocolate/Strawberry/Banana	Boots	0.600	32.35	44.44	63	Whey
Holland & Barrett Body Fit Whey Protein Smoothie Mixed Berry	Holland & Barrett	0.470	17.25	36.70	55.6	Whey
Maximuscle Cyclone Chocolate	Boots	1.2	63.00	52.50	50	Whey
Maximuscle Cyclone Strawberry/Chocolate/Orange/Vanilla	Elvery Sports	1.2	59.99	50.00	50	Whey
Maximuscle Cyclone Strawberry/Chocolate/Orange/Banana	Health Matters	1.2	56.99	47.49	50	Whey
Holland & Barrett Spirulina Soya Protein Drink Strawberry	Holland & Barrett	0.907	15.50	17.09	40.3	Soy

NOTES: Information correct as at Friday 6th Feb 2009. Shakes are listed in descending order of protein content per 100g.

and consumers may want to avoid aspartame and phenylalanine. However the 'Pea Protein Isolate' contains no added ingredients, and Solgar's 'Whey to Go' is purely whey protein powder with a natural vanilla bean flavour and the amino acid L-Glutamine.

Milk protein consists of about 20% whey and 80% casein. The more efficiently a protein is absorbed by the body, the higher the Biological Value (BV) the protein is said to have. Most of the brands we examined are based on whey protein. Whey offers the highest Biological Value (BV) of all protein supplements currently available. It is increasingly being separated from casein to make whey protein powders, drinks and bars. People who are allergic to dairy products or who are lactose intolerant may have problems with whey and casein based products depending on the lactose content. Side effects can include stomach cramps and nausea so it is important to find out whether the culprit is casein or whey. Some products are lactose free or contain Lactase, an enzyme that helps in the digestion of lactose. It is better to purchase in smaller amounts to see how your body reacts before investing in a larger container.

Daily requirements

Current general dietary recommendations advise at least 55% of our daily calorie intake should come from carbohydrates, less than 30% should come from fat, and only 12 - 15% from protein. An individual's size, activity levels and exercise regime must be considered in relation to their protein requirements. For the general and active population, protein recommendations are 0.8-1g per kg body weight per day, for endurance athletes, 1.2-1.4g per kg body weight per day and for strength-training athletes 1.6-1.8g per kg bodyweight per day.

For most people of average weight, this amounts to 70 – 90g per day. A balance of carbohydrate, fat, and protein should be obtained from every meal. Tofu, nuts, cottage cheese, chickpeas, oat bran and ricotta cheese can all be consumed to make up the recommended allowance of protein. Adequate protein can be obtained from dietary sources when you consider that a chicken breast contains 30 - 60g of protein and three ounces of lean beef offers roughly 25g.

Timing your intake

What you choose to eat and drink plays a role in both performance and recovery when exercising so the timing of your nutritional intake is significant. A meal or a snack high in carbohydrate, low in fat and containing some protein which is based on easily digestible foods should be consumed two to three hours before exercising. After exercising your body is once again ready to refuel. Carbohydrates are your body's main source of energy but adding a little protein is also necessary at this point to help repair damaged muscles. Carbohydrates improve the bodies' uptake of protein and if carbohydrates are in low supply your body will automatically use protein as the energy source which can result in the loss of lean muscle mass.

Research has shown that a post-workout snack should consist of about four times as much carbohydrate as protein. This snack can be consumed in liquid or solid form. Bananas with low-fat yogurt, a tuna sandwich or bread spread with nut butter and honey all provide carbohydrates and protein. Some people do not like eating after strenuous exercise so this is often when protein

Useful websites

Eirpharm Medicines in Sport
www.eirpharm.com

Irish Sports Council
www.irishsportscouncil.ie

DIETARY SOURCES OF PROTEIN

The most concentrated sources of protein come from red meat, chicken, eggs, turkey, fish and dairy products. High protein diets from animal sources are usually high in saturated fats and cholesterol so it's important to alternate lean meat and low fat dairy with plant sources of protein. Protein is found in most plant foods including grains, beans, nuts, tofu and vegetables, particularly broccoli. Many plant foods are also good sources of calcium and contain fibre, carbohydrates, healthy fats and phyto-chemicals that protect against disease.

Protein content of some popular animal and plant foods:

Beef 3 oz = 26g
Cheese 3 oz = 21 grams
Chicken 3 oz = 21 grams
Eggs 2 large =13 grams
Fish 3 oz = 21 grams
Milk 8 oz = 8 grams
Tofu 3 oz = 15 grams
Turkey 3 oz = 21 grams
Yogurt 8 oz = 8 grams
Peanut butter 2 tbsp = 8 grams

shakes are consumed. Occasionally, this is better than skipping a snack or meal but they cannot replace the benefits of whole foods. Isotonic sports drinks are also often taken at this point (see 'Energy Drinks', *Consumer Choice* Dec 2007 p462). A high-carbohydrate meal should ideally be consumed within two hours of your post-exercise snack.

According to Dr. Giles Warrington, sport and exercise physiologist and lecturer at Dublin City University (DCU), "Those involved in heavy training need to consume about 0.2 g per kg body weight of protein after exercise which typically equates to about 15-20g. This should be consumed immediately post-exercise to promote recovery and muscle repair. In this regard, protein shakes may have a role to play because they are generally easily digested and convenient to use. However in the case of the general population who are healthy and physically active, a good, balanced diet will provide sufficient protein." He says that scientific evidence shows that there is a limit to the daily recommended protein intake and once the absorption level is exceeded the remainder is excreted by the body. Dr Warrington also highlights the fact that athletes need to take responsibility for what they put into their bodies and to be aware of the risks of cross contamination when using supplements (see also 'Supplement Safety', *Consumer Choice* Jan 2009 p6).

Protein overload

According to a report in the journal *Clinical Pharmacy*, consuming too much protein can lead to digestive difficulty, dehydration, gout, and calcium loss. Overloading on protein can also rob the body of its calcium stores and has been implicated in osteoporosis. The body will only use the precise amount of protein it needs and the rest is excreted in the urine. Excess protein must be broken down by the kidneys and this puts a strain on those with liver or kidney problems. Furthermore, when excess protein is excreted, calcium and other valuable minerals are also lost.

Personal trainer Karl Henry, who is also one of the experts on RTE's Operation Transformation, told *Consumer Choice* that protein shakes have become fashionable in gyms but he believes they are over-prescribed in many cases. "Protein supplements are not what we tend to promote to our clients. There is a lot of hype surrounding them but they are not a quick fix and won't give you that magic six-pack." He says that many brands are very high in sugar and that the whey-based products are best for those who do take them. Karl became a vegetarian a number of years ago after reading *The China Study* by T. Colin Campbell, Ph.D., and Thomas M. Campbell II. This study claims that diets high in protein, particularly animal protein including casein in cow's milk, are linked to diseases such as heart disease, cancer and Type 2 diabetes. *The China Study* recommends that people eat a whole food, plant-based diet and avoid consuming beef, poultry and milk to minimise or reverse the development of chronic disease.

Balancing act

Getting the correct balance of nutrients in your diet is difficult and requirements differ depending on your lifestyle. High-protein foods are frequently also high in fat, like meat, milk and cheese but fortunately, there are lower fat options available including skim milk, reduced-fat cheeses and lean meats. Eating protein as part of every meal or snack will make you feel satisfied for longer meaning you are likely to consume less calories overall. However if your protein choices consistently contain a lot of fat you may gain weight because fat provides more than twice the amount of calories per gram than carbohydrate or protein. Protein shakes can add hundreds of extra calories to your daily intake and if you don't need these your body stores them as fat. The manufacturers of protein shakes may claim their products promote weight loss but you cannot realistically expect them to reduce your weight. This can only be achieved by decreasing portion sizes and increasing the amount of calories burnt by exercising regularly.

Report by Sinéad Mc Mahon CC

choice comment

Bulking up requires effort and it is exercise, not extra protein, that builds strength, bone density and bigger muscles. The idea that a high protein intake results in increased muscle mass is overstated and you are likely to be getting more than enough already. Extensive exercise requires fuel from extra carbohydrates rather than protein. Plenty of fruit and vegetables are also required to provide vitamins that will combat the free radicals produced naturally during exercise which impair immune functioning. A structured nutrition plan is essential for athletes but amino acids such as creatine should not be used in isolation without the guidance of a medical professional. It's generally better to get protein from a balanced diet and the key is to have a regular and adequate intake of good quality sources. If you do decide to supplement, read the directions to ensure you are taking the right amount and make sure to drink plenty of water. If you are worried about the effects, consult your GP.