

MD+ Power Drink

The Revolutionary, Research-Driven, Anabolic, AntiCatabolic, Fat-burning, Training Drink



Power Drink fills a gap that's been overlooked by all the other supplement companies. While they're absorbed in what to use before and after training, and rightly so, they're missing one of the most important opportunities for maximizing the results you get from training.

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Taking supplements in and around training is one of the most efficient and productive ways to use nutritional supplements. That's because the body is most receptive to these supplements under the stress of exercise. As such, it makes good sense to be fully prepared to maximize the anabolic and fat burning effects of exercise by using the right nutritional supplement array before, during and after exercise.

I formulated **MD+ Exersol** to be the complete exercise solution and as such, to take the guesswork out of what supplements to use before, during and after training. Resolve and Resolve Competition to get your body ready and able to train, Power Drink to sustain and support your energy and metabolism while you work out, and Amino to maximize protein synthesis and make use of the post workout anabolic period.

While all three formulations are cutting edge and make Exersol unique, it's Power Drink that fills a glaring gap in training supplements. And I'll explain why.

You Don't Have to Break Down to Build Up

We all know that during training muscle is broken down. Most people believe that this breakdown is a necessary part of training. After all you have to break muscle tissue down before you can build it up. Don't you? Unfortunately that's one of the most stubborn of training myths.

Muscle breakdown isn't what provides the adaptation stimulus for increasing muscle size. It's the microscopic damage done to the muscle cell structure and the subsequent adaptation to that damage that determines the muscle building response.

You don't have to break down the muscle at all to get this response in full force. In fact doing so is counter productive. The more muscle you keep from breaking down, and the more you increase protein synthesis, the better the results from your training. Taking Power Drink while you're training will put you miles ahead of everyone else who just uses water or at best a carbohydrate, low protein drink.

Power Drink, because of its effects on increasing protein synthesis and decreasing protein breakdown, is a powerful anabolic and anticatabolic product. As well, Power Drink increases cellular hydration and the utilization of amino acids and creatine by working muscle.

As if that wasn't enough, Power Drink, because of its positive effects on the fat burning hormones and mechanisms actually allows you to burn more body fat while you're training.

And with the other ingredients included in Power Drink, such as the dipeptide carnosine and citric acid, which among other things are efficient buffering agents, you can train harder and longer and know that you have a powerful ally that will help you make good use of all that hard work.

Besides a hefty dose of high quality protein, Power Drink also contains several anabolic and cytoprotective amino acids and peptides, electrolytes and other ingredients that help maximize the anabolic and fat burning potential of training, and much more.

The formula contains no carbohydrates or fat except for glycerol, which does not raise either glucose or insulin levels appreciably, and ribose, which increases the reformation of ATP and other important cellular compounds. The glycerol, along with the taurine, plays a vital part in keeping the muscles hydrated and thus in an anabolic state.

The bottom line is that Power Drink is a research driven training drink that provides the nutrients necessary to increase muscle size and decrease body fat. And by providing all the necessary ingredients to feed working muscles and shift the use of body fat as the energy source for training, Power Drink dramatically increases the positive effects of training, allows you train longer and harder, and increases recovery.

Ingredients in Power Drink and Their Effects

Power Drink contains several ingredients that maximize the training effect. I've listed some of them below, along with a brief explanation of what they do.

Protein and Amino Acids

The protein and amino acid composition in Power Drink is unique and the resulting amino acid array maximizes protein synthesis and minimizes muscle catabolism.

One serving of Power Drink (44 grams) contains over 30 grams of whey protein isolate, a "fast" protein that results in high systemic amino acid levels. The same properties that make whey protein a bad choice as a nighttime protein make it an excellent choice as a training protein since it can be taken continuously all through the training session. And the whey protein isolate is the best choice since it decreases the bloating and flatulence often seen with high protein intake.

The whey isolate has a direct effect on increasing protein synthesis, and at the same time increases systemic levels of the potent anabolic hormones and growth factors, including insulin, testosterone, growth hormone and insulin-like growth factor I (IGF-I).

As well the whey protein in Power Drink encourages the formation of the glutathione and increases the body's antioxidant and immune capacity, which in turn translates to increases in training efficiency and recovery.

Branched Chain Amino Acids

The protein formulation contains close to 9 grams of branched chain amino acids per serving – the whey in Power Drink is approx 25% BCAAs, the glutamine peptides contain over 11%, and there's an extra 500 mg of leucine, which has been shown to be an important regulator of protein synthesis.

Glutamine and Glutamate

Power Drink contains lots of glutamine, some as glutamine peptides (Power Drink contains 3 grams of glutamine peptides per serving), the fastest absorbable form, and the rest in a slower absorbed form as part of the whey protein.

L-Glutamine, the most abundant free amino acid in muscle, has several important effects in the body and favorably affects growth hormone and cortisol levels, protein synthesis, cell volume, muscle catabolism and gastrointestinal and immune function.

However, excessive amounts of glutamine are not necessary to obtain these effects and in fact may even be counter productive. That's because of the introduction of the extra amine group that has to be detoxified as glutamine is metabolized to glutamate and in turn to 2-oxoglutarate - the crucial TCA cycle anapleurotic intermediate that is responsible for increased TCA cycle flux and ATP formation, as well as anabolic and fat burning effects.

So, Power Drink also contains glutamate (glutamic acid), an amino acid that is also important when it comes to increasing anaerobic and aerobic energy, and minimizing ammonia buildup. One 44 gram serving of Power Drink contains over 7 grams of glutamine and glutamate.

Also Power Drink doesn't contain any free glutamine but rather contains peptide bonded glutamine that is stable in water.

Arginine

Arginine and other ingredients in Power Drink, increase GH, IGF-I and insulin secretion and response, thus providing a synergistic anabolic effect on muscle and canceling out insulin's lipogenic and anti-lipolytic effects. In other words you get all the good anabolic and fat burning effects from the synergism and none of the bad.

Arginine also increases nitric oxide formation, which is felt to have a beneficial effect on blood flow in muscle and thus enhance nutrient and oxygen delivery, buffering and the clearing of metabolic by products, and increasing protein synthesis.

Power Drink contains over 1200 mg of arginine, 500 mg in free form, 66 mg bound up in peptide form, and 640 mg in the slower release form as part of the whey protein.

Taurine

Taurine, a sulfur-containing amino acid and the second most abundant amino acid, and the most abundant free amino acid, found in skeletal muscle tissue, has many properties that can enhance the training effect, including it's abilities to increase growth hormone, protect joints, and protect the liver, as well as its antioxidant and anabolic effects. Taurine has also been shown to have insulin like effects and to help control cell volume. The volumizing effect on muscle cells is felt to lead to an increase in protein synthesis.

Over the years oral taurine administration has been shown to help muscle cramping in patients with liver cirrhosis and myotonic dystrophy. Several studies have suggested that it may also help to alleviate muscle cramps occurring during and after exercise. But there's more to the story.

A recent study on rats has shown that oral taurine supplementation may increase muscle performance and reduce muscle injury caused by exercise.¹ The aim of the study was to determine if increasing muscle levels of taurine would decrease free radical damage after exercise-induced injury. The authors found that first of all taurine levels rose in muscle after supplementation, and secondly that running performance was improved by the taurine supplementation. Thus it appears taurine supplementation may facilitate exercise performance and reduce some of the counterproductive muscle injury caused by exercise.

Another recent study also in rats showed that taurine is useful for reducing physical fatigue and muscle damage during exercise training, presumably due to its antioxidant effects and the beneficial effects that taurine has on metabolism and on muscle and cardiac functions.²

And as if that weren't enough, there is some evidence to show that taurine may enhance training further by decreasing training induced fatigue. A recent paper has

shown that Na⁺-K⁺-ATPase activity is depressed with fatigue, regardless of training state, suggesting that this may be an important determinant of fatigue.³ Another recent paper associated fatigue and training with reduced Ca²⁺-ATPase activity.⁴ Previous studies have shown that taurine stimulates Na⁺-K⁺-ATPase activity and also the pumping rate of the Ca²⁺-activated ATPase pump.

While the evidence is circumstantial at present and a direct study linking the two research findings needs to be done, it's quite possible that supplemental taurine, besides all the positive effects we know it has, may also reduce exercise induced fatigue.

Because of all these properties, taurine (1000 mg per serving) is an integral part of Power Drink.

Other Amino Acids

Several amino acids are present in substantial amounts in the combination of the whey protein isolate and the glutamine peptides (see amino acid arrays of both below).

For example Power Drink contains over 2200 mg of **proline** per serving. Proline, one of the main components of collagen and thus tendons, ligaments and joints, is important for musculoskeletal health and might be useful in decreasing injury and increasing recovery. As well, proline is important in DNA and protein synthesis, and for the immune system. Decreases in serum proline (and **alanine** – there's over 1600 mg in Power Drink) levels have been noted in prolonged exercise. Part of this is likely due to the gluconeogenic properties of both amino acids.

Power Drink contains almost 3000 mg of **lysine**, an amino acid important for stimulating GH secretion (in concert with other amino acids including arginine and glutamine) and in optimizing protein synthesis.

There's also about 3500 mg of **aspartic acid** per serving. Aspartic acid (aspartate) has been shown to enhance both aerobic and anaerobic muscle capacity. A recent study found that the supplemental use of aspartate and asparagine can decrease exercise fatigue.⁵

Power Drink also has significant amount of other amino acids, including about 1100 mg of each of the neurotransmitter precursors **phenylalanine** and **tyrosine**.

Citric Acid (Citrate)

Citric acid has a number of useful functions, such as increasing the absorption and bioavailability of several nutrients, including creatine, calcium and magnesium. As well, it has antioxidant properties and adds some tart flavoring to Power Drink.

However, its most useful function is related to the effects it has on increasing the supply of mitochondrial citric acid increases the flux of the Citric Acid Cycle (also known as the TCA Cycle and Krebs Cycle).

It's important, however, not to take in excessive amounts of citrate, a practice that's becoming more common among bodybuilding and power athletes. Supplemental citric acid or citrate ends up in the cytoplasm of cells and thus its fate depends on the amount present and activity level.

Cytosolic citrate, the citrate that is a result of using oral citrate, differs somewhat from mitochondrial citrate in that mitochondrial citrate, in the right amounts, can increase TCA cycle flux and is an anaplerotic TCA cycle intermediate. Cytosolic citrate, in smaller amounts, can be translated into pyruvate (via the actions of malate dehydrogenase and malic enzyme) and then enter the TCA cycle either as acetyl-coA or oxaloacetate, depending on many circumstances.

However, excessive amounts of cytosolic citrate may be counter productive as cytoplasmic citrate (via the acetyl-coA and malonyl-coA axis) has antilipolytic and lipogenic properties. In other words it can decrease the breakdown and oxidation of body fat, and acts as a stimulus for increasing fat production. Also high levels of citric acid and/or citrate commonly cause gastrointestinal upset.

There's just over 500 mg of citric acid in one serving of Power Drink. Just enough to get the useful effects, as a buffering agent and in stimulating TCA flux, but not enough to upset your stomach, or accumulate in the cytoplasm and produce counter productive changes in fat metabolism.

Creatine Monohydrate, Phosphorus, Ribose and Sodium

Power Drink contains several ingredients that maximize phosphocreatine (PC) levels in muscle, including creatine monohydrate, the creatine precursors (arginine, glycine and methionine) and other amino acids that increase the utilization and effectiveness of the creatine in increasing tissue PC levels. are supplied in Power Drink.

As well, by providing some of the raw material that is used in forming ATP, including phosphorus and ribose, and the increased stimulus for ATP formation, Power Drink increases both Aerobic and Anaerobic ATP production and salvage.

Sodium is also important for increasing creatine uptake in muscle and some studies has been found to be important for creatine uptake into relatively insulin insensitive muscles such as the soleus.⁶

Carnosine, Citrate, Phosphorus and Creatine

Acid, or H⁺ ions are produced as you exercise, especially when you push the envelope. The buildup of these ions results in an intracellular proton load that comes from both the formation of lactic acid and it's subsequent dissociation, and the production of ATP when there's a lack of oxygen available to the muscle cells - anaerobic ATP production. While generally true, it's also felt that lactic acid is produced locally under situations where there is enough oxygen, that is under aerobic conditions.

Overall, however, the end result can be an accumulation of H⁺ ions that is thought to increase muscle fatigue and interfere with muscle contraction. And there is that the use of buffering compounds enhances exercise performance in cases where relative tissue hypoxia is a factor.⁷

The intracellular buffers that are capable of contributing to this enhanced buffering capacity are phosphorus, carnosine, citrate (citric acid) and creatine. All of these ingredients are an integral part of the Power Drink formula.

Carnosine, a dipeptide (histidyl-alanine) and a potent antioxidant and buffering agent, is found in the highest concentration in muscle and brain, where it is felt to have an anti-ischemic effect and thus protect and buffer these tissues.

Carnosine is also believed to decrease both central and peripheral fatigue. In the brain it is also used to synthesize neurotransmitters which are involved in fatigue. In muscle, carnosine decreases exercise fatigue and contribute to recovery.

Electrolytes and Minerals

Studies have shown that replacement of water, electrolytes, especially **sodium** and **potassium**, and certain minerals (which also act as electrolytes) while exercising has a beneficial effect on strength, exercise intensity and endurance. Besides replacing various nutrients that are affected by exercise, these substances also have potential beneficial training effects. For example, **magnesium**, **calcium** and **potassium** are important in protein synthesis, muscle contraction, energy production and metabolism.

Glycerol or Glycerine

I added glycerol to the present Power Drink formulation because in lower doses it can have beneficial effects without any adverse effects on low carb dieting. Glycerol has several possible roles in increasing the effects of exercise and exercise efficiency.

Glycerol, and creatine and taurine, are predominantly present in the intracellular space and as such all three have distinct volumizing effects. Increasing intracellular volume is considered to increase protein synthesis and thus to have anabolic effects.

Glycerol also results in an increase in body water that has been theorized to result from a glycerol mediated increase in water reabsorption in the distal tubules and collecting ducts of the kidney. So in fact the use of glycerol can result in both increased intracellular and extracellular fluid volume. Since both glycerol and creatine have volumizing effects, the use of both compounds together may have an additive anabolic effect on muscle cells.

Besides the above effects, glycerol may also have some beneficial effects on athletic performance due to its osmotic action. Recent research has shown that when a glycerol and water mix is used as a hydration beverage before training or competition performance improves. Thus glycerol-induced hyperhydration by delaying the adverse effects of dehydration, reduces the thermal burden of exercise⁸.

The bottom line in all this is that glycerol can be useful and may provide some anabolic effects. Also by helping to combat dehydration, and by supplying energy either by being converted to glucose or being oxidized along the same pathway as glucose glycerol supplementation may help fight fatigue during periods of intense training.

Xylitol

Xylitol, glycerol, and ribose make up the bulk of the carbohydrate content of Power Drink, and increase its palatability. But there are other reasons why both of these were included in the formulation.

Studies have shown that xylitol affects metabolism in different ways than sugars and most other carbs and as such not impacting on insulin or fatty acid oxidation.^{9 10} As well, other studies have shown that xylitol may improve nitrogen balance, increase fat oxidation and decrease carbohydrate oxidation (likely spares glycogen) as compared to glucose (likely secondary to a decreased insulin response).^{11 12}

Summary

Power Drink, with its many natural ergogenic ingredients, and for many reasons, is the ideal training drink.

The bottom line is that Power Drink will:

- **Maximize the anabolic and fat burning effects of exercise.**
- **Maximize protein synthesis and decreases muscle breakdown during training and anytime it's used.**
- **Maximize energy for training through both anaerobic (maximizing ATP and phosphocreatine levels in muscle tissue thus increasing anaerobic stamina and power) and aerobic pathways (maximizing TCA cycle flux by providing anapleurotic amino acids, increasing gluconeogenesis, and maximizing the use of fat as the primary aerobic fuel).**
- **Decrease both peripheral and central fatigue.**
- **Replace and replenish nutrients and fluid lost through exercise.**
- **Prevent muscle cramps.**
- **Increase training time and efficiency.**
- **And Enhance recovery.**

Those who want to maximize the anabolic and fat burning effects of exercise should also look at [Exersol](#), the EXERCISE SOLUTION, which includes [Resolve](#), Power Drink and [Amino](#).

Amino acid profile of Glutamine Peptides - wheat protein hydrolysate

Amino acid	<i>g per. 100 g hydrolysate</i>
L-Alanine (Ala)	1.8
L-Cysteine (Cys)	0.9
L-Aspartate (Asp)	0.2
L-Glutamate (Glu)	3.2
L-Phenylalanine (Phe)	4.8
L-Glycine (Gly)	2.8
L-Histidine (His)	1.6
L-Isoleucine (Ile)	2.6
L-Lysine (Lys)	...
L-Leucine (Leu)	5.6
L-Methionine (Met)	1.1
L-Asparagine (Asn)	1.9
L-Proline (Pro)	12.3
L-Glutamine (Gln)	29.0
L-Arginine (Arg)	2.2
L-Serine (Ser)	4.4
L-Threonine (Thr)	2.0
L-Valine (Val)	3.0
L-Tryptophan (Trp)	...
L-Tyrosine (Tyr)	2.5

Whey Protein Isolate Amino Acid Profile

Per 100g of protein

L-Alanine	4.9g
L-Arginine	2.0g
L-Aspartic Acid	10.9g
L-Cystine	2.7g
L-Glutamic Acid	18.0g
L-Glycine	1.7g
L-Histidine	1.7g
L-Isoleucine	6.1g
L-Leucine	9.6g
L-Lysine	9.1g
L-Methionine	1.8g
L-Phenylalanine	3.0g
L-Proline	5.8g
L-Serine	4.7g
L-Threonine	7.8g
L-Tryptophan ⁺	1.9g
L-Tyrosine	3.2g
L-Valine	5.1g

Supplement Facts:		
Serving Size: 2 rounded scoops of dry powder (44g)		
Servings Per Container: 14		
	Amount Per Serving	% Daily Value
Calories	160	
Calories from fat	10	
Total Fat	1g	2%*
Saturated Fat	0.5g	3%*
Cholesterol	25mg	8%*
Total Carbohydrate	3.5g	1%*
Sugars	2g	†
Protein	32g	64%*
Calcium	80mg	8%*
Phosphorus	80mg	8%*
Magnesium	110mg	30%*
Sodium	150mg	6%*
Potassium	140mg	4%*
Glutamine Peptide	3000mg	†
Creatine	1000mg	†
Taurine	1000mg	†
Arginine	500mg	†
Leucine	500mg	†
D-Ribose	100mg	†
Other Ingredients: Ion exchange whey protein isolate, whey protein concentrate, glycerine, carnosine, natural flavors, citric acid, beet powder for color, sucralose and xylitol.		

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