

# Workout Supplements

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WORKOUT SUPPLEMENTS Help on accessing alternative formats, such as Portable Document Format ( PDF ), Microsoft Word and PowerPoint ( PPT ) files, can be obtained in the alternate format help section. (PDF Version - 620 KB) This monograph is intended to serve as a guide to industry for the preparation of Product Licence Applications (PLAs) and labels for natural health product market authorization. It is not intended to be a comprehensive review of the medicinal ingredient. Notes Text in parentheses is additional optional information which can be included on the label at the applicant's discretion. The solidus (/) indicates that either term and/or statement may be selected on the label. Sodium and ingredients where sodium is a substantial component (e.g. sodium chloride) are not permitted as a medicinal ingredients on this monograph due to health concerns associated with chronic supplemental use of sodium, namely hypertension, which remains the most common and most important risk factor for cardiovascular disease. However, the use of sodium as a counter-ion in medicinal or non-medicinal ingredients (e.g. sodium salts of minerals) is acceptable where warranted. Restrictions when this monograph is combined with other monographs (Class II and III applications): When combining L-Carnitine with Acetylcarnitine, the total quantity of these ingredients cannot exceed 4 grams per day and 2 grams per single dose. Date July 25, 2025 Proper name(s), Common name(s), Source information Table 1. Proper name(s), Common name(s), Source information Group 1: Proteins Proper name(s) Common name(s) Source information Source ingredient(s) Source material(s) Part(s) Acheta domesticus House cricket N/A Acheta domesticus Whole Alfalfa protein concentrate Alfalfa protein concentrate N/A Medicago sativa Herb top Beef protein isolate Beef protein isolate N/A Bos taurus Muscle Casein Casein Acid casein Calcium caseinate Calcium sodium caseinate Sodium caseinate Bos taurus Milk Casein hydrolysate Hydrolyzed casein Casein hydrolysate Hydrolyzed casein N/A Bos taurus Milk Casein micelles Micellar casein N/A Bos taurus Milk Chia protein concentrate Chia protein concentrate N/A Salvia hispanica Seed Chia protein isolate 1 Chia protein isolate N/A Salvia hispanica Seed Chickpea protein concentrate Chickpea protein concentrate N/A Cicer arietinum Seed Chickpea protein isolate 1 Chickpea protein isolate N/A Cicer arietinum Seed Cicer arietinum Chick-pea Garbanzo N/A Cicer arietinum Seed Coconut protein concentrate Coconut protein concentrate N/A Cocos nucifera Seed endosperm Coconut protein isolate 1 Coconut protein isolate N/A Cocos nucifera Seed endosperm Cucurbita pepo Acorn squash Bitter bottle gourd Ghia kaddu Marrow Pumpkin Squash N/A Cucurbita pepo Seed Defatted wheat germ protein Defatted wheat germ protein N/A Triticum aestivum Seed germ Fava bean protein concentrate Fava bean protein concentrate N/A Vicia faba Seed Fava bean protein isolate 1 Fava bean protein isolate N/A Vicia faba Seed Fish protein hydrolysate Fish protein hydrolysate N/A Clupea harengus Egg Fish semen Ovary Testis Gadus chalcogrammus Meat Muscle Gadus morhua Meat Merluccius productus Meat Micromesistius poutassou Meat Muscle Molva dypterygia Meat Salmo salar Meat Scomber scombrus Meat Flaxseed protein Flaxseed protein N/A Linum usitatissimum Seed Gryllodes sigillatus Tropical house cricket N/A Gryllodes sigillatus Whole Hemp protein concentrate Hemp protein concentrate N/A Cannabis sativa Non-viable seed Hemp protein isolate 1 Hemp protein isolate N/A Cannabis sativa Non-viable seed Lemna minor Common duckweed N/A Lemna minor Whole plant Lentil protein concentrate Lentil protein concentrate N/A Lens culinaris Seed Lens culinaris Gram Lentil N/A Lens culinaris Seed Linum usitatissimum Flax Flaxseed Linseed N/A Linum usitatissimum Seed Medicago sativa Alfalfa Lucerne N/A Medicago sativa Herb top Milk protein concentrate Milk protein concentrate N/A Bos taurus Milk Milk protein isolate 1 Milk protein isolate N/A Bos taurus Milk Oryza sativa Asian rice Black rice Purple rice Rice N/A Oryza sativa Seed Pea protein concentrate Pea protein concentrate N/A Pisum sativum Seed Pea protein isolate 1 Pea protein isolate N/A Pisum sativum Seed Pisum sativum Pea N/A Pisum sativum Seed Inca peanut protein Sacha inchi protein Inca peanut protein Sacha inchi protein N/A Plukenetia volubilis Seed Plukenetia volubilis Inca-peanut Sacha inche Sacha inchi N/A Plukenetia volubilis Seed Potato protein Potato tuber protein Potato protein Potato tuber protein N/A Solanum tuberosum Tuber Pumpkin seed protein concentrate Pumpkin seed protein concentrate N/A Cucurbita pepo Seed Rice protein concentrate Rice protein concentrate N/A Oryza sativa Seed Salvia hispanica Chia N/A Salvia hispanica Seed Soy protein concentrate Soy protein concentrate N/A Glycine max Seed Soy protein isolate 1 Soy protein isolate N/A Glycine max Seed Vicia faba Fava bean N/A Vicia faba Seed Water lentil protein concentrate Water lentil protein concentrate N/A

Lemna minor Wolffia globosa Whole Wheat protein isolate 1 Wheat protein isolate N/A Triticum aestivum Seed germ Whey protein concentrate Whey protein concentrate N/A Bos taurus Capra hircus Milk Whey protein hydrolysate Whey protein hydrolysate N/A Bos taurus Capra hircus Milk Whey protein isolate 1 Whey protein isolate N/A Bos taurus Capra hircus Milk Wolffia globosa Asian watermeal N/A Wolffia globosa Whole plant 1 For isolate, the potency information should be equivalent to 90% or more protein on a dry weight basis. Group 2: Amino acids Group 2a: Essential amino acids Proper name(s) Common name(s) Source information Source ingredient(s) (S)-alpha-Amino-1H-imidazole-4-propanoic acid L-Histidine L-Histidine L-Histidine L-Histidine hydrochloride (2S,3S)-2-Amino-3-methylpentanoic acid L-Isoleucine L-Isoleucine L-Isoleucine L-Isoleucine ethyl ester L-Isoleucine ethyl ester hydrochloride L-Isoleucine hydrochloride N-Acetyl-L-isoleucine (S)-2-Amino-4-methylpentanoic acid L-Leucine L-Leucine L-Leucine hydrochloride L-Leucine L-Leucine ethyl ester L-Leucine ethyl ester hydrochloride L-Leucine methyl ester hydrochloride N-Acetyl-L-leucine N-Glycyl-L-leucine (S)-2,6-Diaminohexanoic acid L-Lysine L-Lysine Lysine L-Lysine L-Lysine-L-aspartate L-Lysine monohydrochloride L-Lysine acetate L-Lysine dihydrochloride (S)-2-Amino-4-(methylthio)butanoic acid L-Methionine L-Methionine Methionine DL-Methionine L-Methionine N-Acetyl-L-methionine (S)-2-Amino-3-phenylpropanoic acid L-Phenylalanine L-Phenylalanine DL-Phenylalanine L-Phenylalanine L-Phenylalanine methyl ester N-Acetyl-L-phenylalanine (2S,3R)-2-Amino-3-hydroxybutyric acid L-Threonine L-Threonine DL-Threonine L-Threonine (S)-alpha-Amino-1H-indole-3-propanoic acid L-alpha-Aminoindole-3-propionic acid L-Tryptophan L-Tryptophan Tryptophan L-Tryptophan (S)-2-Amino-3-methylbutanoic acid L-Valine L-Valine DL-Valine L-Valine L-Valine ethyl ester L-Valine ethyl ester hydrochloride L-Valine hydrochloride N-Acetyl-L-valine Group 2b: Non-essential amino acids Proper name(s) Common name(s) Source information Source ingredient(s) (S)-2-Aminopropanoic acid L-Alanine L-Alanine Alanylglutamine DL-Alanine L-Alanine L-Alanine ethyl ester hydrochloride 3-Aminopropanoic acid 3-Aminopropionic acid beta-Aminopropionic acid beta-Alanine beta-Alanine beta-Alanine ethyl ester (S)-2-Amino-5-[(aminoiminomethyl) amino] pentanoic acid L-Arginine L-Arginine DL-Arginine L-Arginine L-Arginine alpha-ketoglutarate L-Arginine ketoisocaproic acid L-Arginine monohydrochloride (S)-2,4-Diamino-4-oxobutanoic acid L-Asparagine L-Asparagine L-Asparagine (S)-Aminobutanedioic acid L-Aspartic acid L-Aspartic acid L-Aspartic acid Potassium aspartate Potassium magnesium aspartate (S)-N5-Carbamoylornithine L-Citrulline N5-(Aminocarbonyl)-L-ornithine Citrulline L-Citrulline L-Citrulline ethyl ester L-Citrulline malate L-Citrulline (R)-2-Amino-3-mercaptopropanoic acid L-Cysteine L-Cysteine L-Cysteine hydrochloride L-Cysteine hydrochloride monohydrate D-Ribose-L-cysteine L-Cysteine (S)-2-Aminopentanedioic acid L-Glutamic acid L-Glutamate L-Glutamic acid L-Glutamic acid hydrochloride L-Glutamic acid Monosodium glutamate (S)-2,5-Diamino-5-oxopentanoic acid L-Glutamine Glutamine L-Glutamine L-Glutamine L-Glutamine ethyl ester Aminoacetic acid Glycine Glycine Glycine hydrochloride N-Glycyl-L-leucine (S)-2-Pyrrolidinecarboxylic acid L-Proline L-Proline L-Proline (S)-2-Amino-3-hydroxypropanoic acid L-Serine L-Serine L-Serine (S)-alpha-Amino-4-hydroxybenzenepropanoic acid L-Tyrosine L-Tyrosine Tyrosine L-Tyrosine L-Tyrosine ethyl ester N-Acetyl-L-tyrosine Group 3: Carbohydrates Proper name(s) Common name(s) Source information Source ingredient(s) Source material(s) Part(s) D-Fructose D-Fructose N/A Malus domestica Fruit D-Fructose N/A N/A D-Galactose D-Galactose D-Galactose N/A N/A D-Glucose Dextrose D-Glucose Glucose D-Glucose monohydrate Glucose N/A N/A 4-O-beta-D-Galactopyranosyl-D-glucose Lactose Lactose N/A N/A Maltodextrin Maltodextrin Maltodextrin N/A N/A D-Mannose D-Mannose D-Mannose N/A N/A Solanum tuberosum 1 Potato starch Starch - Potato N/A Solanum tuberosum Tuber Oryza sativa 1 Rice starch Starch - Rice N/A Oryza sativa Seed D-Ribose D-Ribose Ribose D-Ribose-L-cysteine Ribose N/A N/A alpha-D-Glucopyranosyl-beta-D-fructofuranoside beta-D-Fructofuranosyl-alpha-D-glucopyranoside Cane sugar Saccharose Sucrose Sugar N/A Acer saccharum Sap Beta vulgaris Root Borassus flabellifer Sap Malus domestica Fruit Oryza sativa Seed Saccharum officinarum Leaf stalk Pisum sativum 1 Pea starch N/A Pisum sativum Seed Triticum aestivum 1 Starch - Wheat Wheat starch N/A Triticum aestivum Seed endosperm Zea mays 1 Corn starch Starch - Maize Zea mays starch N/A Zea mays Seed Zea mays 1 Waxy maize starch N/A Zea mays Seed 1 Starch ingredients should be prepared (e.g., gelatinized) such that carbohydrates are readily absorbable. Group 4: Ergogenic agents Group 4a: Non-caffeinated ergogenic agents Proper name(s) Common name(s) Source information Source ingredient(s) Source material(s) Part(s) Preparation(s) Calcium beta-hydroxy-beta-methylbutyrate CaHMB Calcium beta-hydroxy-beta-methylbutyrate Calcium beta-hydroxy-beta-methylbutyrate Calcium beta-hydroxy-beta-methylbutyrate monohydrate N/A N/A N/A (L-3-Carboxy-2-hydroxypropyl) trimethylammonium hydroxide, inner salt (R)-3-Carboxy-2-hydroxy-N,N,N-trimethyl-1-propanaminium hydroxide, inner salt L-Carnitine Levocarnitine L-Carnitine Levocarnitine L-Carnitine fumarate L-Carnitine tartrate N/A N/A N/A N-(Aminoiminomethyl)-N-methylglycine monohydrate Creatine monohydrate Creatine monohydrate N/A N/A N/A Eleutherococcus senticosus Ci wu jia Eleuthero Siberian ginseng N/A Eleutherococcus senticosus Root Dry Panax ginseng Asian ginseng Chinese ginseng Hong shen Korean ginseng Korean red ginseng Oriental ginseng Panax ginseng Red ginseng Ren shen N/A Panax ginseng Root Rootlet Dry Group 4b: Caffeine Proper

name(s)	Common name(s)	Source information	Source ingredient(s)	Source material(s)	Part(s)
1,3,7-Trimethylxanthine	3,7-Dihydro-1,3,7-trimethyl-1H-purine-2,6-dione	Caffeine	Caffeine	Caffeine	citrate N/A
N/A	N/A	Camellia sinensis	Leaf	N/A	Coffea arabica
guayusa	Ilex paraguariensis	Leaf	N/A	Paullinia cupana	Seed
N/A	N/A	Theobroma cacao	Seed	N/A	Cola acuminata
Group 5: Vitamins and Minerals	Proper name(s)	Common name(s)	Source information	As per the current NNHPD	
Multi-Vitamin/Mineral Supplement	monograph	Group 6: Complementary ingredients	Proper name(s)	Common name(s)	
1-Amino-4-guanidinobutane	4-(Aminobutyl)guanidine	Agmatine	Agmatine sulfate	N/A	N/A
2-(Dimethylamino)ethanol	Beta-Dimethylaminoethyl alcohol	N,N-Dimethyl-2-hydroxyethylamine	Deanol		
Dimethyl MEA	Deanol bitartrate	N/A	N/A	N/A	Malpighia glabra
Malpighia glabra	Fruit	Dry	Fresh	Piper nigrum	Black pepper
Pepper - black	Pepper - white	White pepper	N/A	Piper nigrum	Fruit
Dry	1-[(2E,4E)-5-(1,3-Benzodioxol-5-yl)-1-oxo-2,4-pentadienyl]	piperidine	Piperine	N/A	Piper nigrum
Fruit	N/A	(beta-Hydroxyethyl)trimethylammonium	2-Hydroxy-N,N,N-trimethylethanaminium	Choline	
Choline	Choline	Choline	alfoscerate	Choline bitartrate	Choline chloride
Choline citrate	Choline dihydrogen citrate	Choline orotate	N/A	N/A	N/A
Capsicum annuum	Cayenne	Cayenne pepper	Chili pepper	Paprika	Red pepper
N/A	Capsicum annuum	Fruit	Dry	all-trans -Lycopene	Lycopene
N/A	Lycopene	N/A	N/A	(S)-2,5-Diaminopentanoic acid	(S)-alpha,delta-Diaminovaleric acid
L-Ornithine	L-Ornithine	hydrochloride	L-Ornithine-L-aspartate	Ornicetil	N/A
N/A	N/A	N/A	2-Aminoethanesulfonic acid	Taurine	L-Arginine
taurinate	Taurine	Taurine ethyl ester	N/A	N/A	N/A
Reference: NHPID 2024.	Route of Administration	Oral	Dosage Form(s)	This monograph excludes foods or food-like dosage forms as indicated in the Compendium of Monographs Guidance Document. Acceptable dosage forms for oral use are indicated in the dosage form drop-down list of the web-based Product Licence Application form for Compendial applications. Note Liquids and solutions are not permitted for products containing Creatine monohydrate, due to lack of stability of the finished product (Dash and Sawhney 2002). Use(s) or Purpose(s)	
Products providing at least 2.6 g of total protein, total protein and amino acids, or total amino acids from Groups 1, 2a and 2b	Workout support/supplement	Athletic support/supplement	Assists in the building of lean muscle tissue/mass when combined with regular weight/resistance training and a healthy balanced diet (NNHPD 2024).	Products containing at least one ingredient from any of Groups 3 or 4a, at or above the relevant minimum doses indicated in the Dose section below	Workout support/supplement
Athletic support/supplement	Products containing at least one ingredient from Group 1, at or above the minimum dose indicated in the Dose section below	Source of protein for the maintenance of good health (CFIA 2024).	Source of protein which helps build and repair body tissues (CFIA 2024).	Source of protein which helps build strong muscles (CFIA 2024).	Source of amino acids involved in muscle protein synthesis (IOM 2005).
Products containing at least one ingredient from Group 2a, at or above the respective minimum dose indicated in the Dose section below	Source of (an) essential amino acid(s) for the maintenance of good health (CNF 2024).	Source of (an) (essential) amino acid(s) involved in muscle protein synthesis (IOM 2005).	Products containing all three of L-leucine, L-isoleucine and L-valine, at or above the respective minimum doses indicated in the Dose section below	Source of branched chain amino acids (BCAAs), which are involved in protein synthesis (IOM 2005).	Products containing at least one ingredient from Group 2b, at or above the respective minimum dose indicated in the Dose section below
Source of (an) (non-essential) amino acid(s) involved in muscle protein synthesis (IOM 2005).	Products containing Beta-Alanine, at or above a minimum dose of 800 mg per single dose and 4.8 g, per day	Increases muscle carnosine levels, a factor in delaying neuromuscular fatigue in intermittent high intensity exercises (Hoffman et al. 2008; Hill et al. 2007; Derave et al. 2007; Harris 2006; Stout et al. 2006).	Products containing L-glutamine, at or above a minimum dose of 5 g, per day	Helps restore plasma glutamine levels depleted after periods of physical stress (e.g. prolonged exhaustive exercise) (Krzywkowski et al. 2001; Bowtell et al. 1999; Castell and Newsholme 1997).	Helps to assist in muscle cell repair after exercise (Newsholme et al. 2003; IOM 2005).
Products containing at least one ingredient from Group 3, at or above the minimum dose indicated in the Dose section below	Source of carbohydrates to support energy production (IOM 2005).	Source of calories which contributes to weight gain (IOM 2005).	Helps to maintain performance/promote endurance in extended (greater than 60 min), high intensity exercise (Kerksick et al. 2008).	Products containing at least one ingredient from Group 4a, at or above the relevant minimum doses indicated in the Dose section below	Helps increase physical performance during intensive exercise (NNHPD 2024).
Additionally, the following recommended uses may be indicated for products containing the corresponding medicinal ingredients, at or above the relevant minimum doses indicated in the Dose section below:	Calcium beta-hydroxy-beta-methylbutyrate (CaHMB)	Enhances muscle strength in previously untrained individuals in combination with intense resistance training exercise (NNHPD 2024).	L-Carnitine sourced from L-Carnitine or L-Carnitine tartrate	Aids in the muscle recovery process by reducing muscle tissue damage associated with a resistance training regimen (Ho et al. 2010; Spiering et al. 2008; Spiering et al. 2007; Kraemer et al. 2006; Kramer et al. 2003; Volek et al. 2002).	Helps support muscle tissue repair in individuals involved in resistance training (Ho et al. 2010; Spiering et al.

2008; Spiering et al. 2007; Kraemer et al. 2006; Kramer et al. 2003; Volek et al. 2002). Helps improve physical performance when used in conjunction with a training regimen (Wall et al. 2011; Cha et al. 2001; Arenas et al. 1994; Huertas et al. 1992; Arenas et al. 1991; Vecchiet et al. 1990; Marconi et al. 1985). Helps delay fatigue during physical activity (Cha et al. 2001; Wall et al. 2011; Karahan et al. 2010). Helps support fat metabolism (Stephens et al. 2007; Karlic and Lohninger 2004; Müller et al. 2002). Helps support fat oxidation (Wall et al. 2011; Stephens et al. 2007; Wutzke and Lorenz 2004; Müller et al. 2002). Products containing L-Citrulline at or above a minimum dose of 3 g, per day L-Citrulline is a precursor of L-Arginine (Ochiai et al. 2012; Waugh et al. 2001). Products containing L-Citrulline sourced from Citrulline malate at or above a minimum dose of 1.7 g (equivalent to 3 g citrulline malate), per day Supports an increase in athletic performance in high-intensity anaerobic exercise with short rest period (Perez-Guisado and Jakeman 2010; Bailey et al. 2015; Bendahan et al. 2002). Creatine monohydrate Increases body/(lean)muscle mass/size when used in conjunction with a resistance training regimen (Brose et al. 2003; Bemben et al. 2001; Volek et al. 1999; Vandenberghe et al. 1997). Improves strength/power/performance in repetitive bouts of brief, highly-intense physical activity (e.g. sprints, jumping, resistance training) (by increasing muscle/intramuscular creatine/phosphocreatine/energy levels) (Okudan and Gökbel 2005; Brose et al. 2003; Preen et al. 2003; Bemben et al. 2001; Volek et al. 1999; Vandenberghe et al. 1997; Hultman et al. 1996) Eleuthero/Siberian ginseng Used in Herbal Medicine to help improve physical performance after periods of physical exertion (Bradley 2006; ESCOP 2003; Hoffmann 2003; Mills and Bone 2000). Panax ginseng Used in Herbal Medicine to help enhance physical capacity/performance (in cases of physical stress) (Kim et al. 2005; ESCOP 2003; Gross et al. 2002; WHO 1999; Gross et al. 1995; Sotaniemi et al. 1995; Schepdael 1993). Products containing Caffeine (Group 4b), at or above the minimum dose indicated in the Dose section below Helps (temporarily) to relieve/reduce fatigue, to promote endurance, and to enhance motor performance (Philip et al. 2006; Doherty and Smith 2005; Smith et al. 2005). Helps (temporarily) to enhance (physical) energy (Philip et al. 2006; Doherty and Smith 2005; Smith et al. 2005). Helps (temporarily) to relieve/reduce fatigue/tiredness (Philip et al. 2006; Doherty and Smith 2005; Smith et al. 2005). Additional claims Products containing ingredients from Group 5, at or above the minimum doses indicated in the Dose section below As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph (except uses or purposes associated with pregnancy). Notes: The above uses can be combined on the product label (e.g. Helps temporarily to relieve fatigue and to assist in muscle cell repair after exercise). The terms 'Helps' or 'Helps to' can be used interchangeably on the label. Uses or Purposes Restrictions Claims from the NNHPD Multi-Vitamin/Mineral Supplements Monograph are only acceptable in addition to at least one claim from Groups 1 to 4. Rules for caffeine (Class I, II and/or III applications): Products containing caffeine from any source (synthetic, isolated or a component of plant material) must not: indicate any uses or purposes related to healthy blood pressure or heart/cardiovascular health at any dose of caffeine (except if the product only contains caffeine from a medicinal ingredient supported for these uses such as green coffee bean extract). indicate any uses or purposes related to nervine/sedative/relaxation, nor contain a sedative at therapeutic dose, at any dose of caffeine. indicate any uses or purposes related to the maintenance/support of good/general health at a daily dose of 40 mg or more total caffeine from all sources. Products providing a total amount of caffeine per day that meets the minimum therapeutic dose (100 mg/day) must indicate a use or purpose associated with caffeine. The maximum amount of total caffeine permitted from all ingredients in the product is 400 mg/day, and 200 mg per single dose. Products providing more than 400 mg of total caffeine per day cannot make any claims other than the ones listed on the Caffeine monograph (Class II applications), unless additional evidence is provided to support another use specific to caffeine (Class III applications). Dose(s) Subpopulation(s) Adults 18 years and older Quantity(ies) Note: The minimum doses indicated below must be met only for medicinal ingredients which are directly supporting any indicated uses or purposes, as per the Use(s) or Purpose(s) section above. Table 2. Doses and methods of preparation for Group 1 (Proteins) 1 Medicinal Ingredients Doses - Potency constituents Protein Isoflavones Minimum/day Maximum/day Maximum/day Total amount of protein from Group 1 + amounts of amino acids from Groups 2a and 2b in the product 2.6 g of protein 90 g of protein N/A Soy protein concentrate and/or isolate 2.6 g of protein 35 g of protein 30 mg of Aglycone Isoflavone Equivalents (AIE) Reference: IOM 2005. 1 The potency of protein on an "as is" weight basis is required to be indicated on the Product License Application form and label for each medicinal ingredient from Group 1. 2 When combining individual amino acids with protein ingredients, the maximum doses for amino acids in Table 3 and Table 4 apply. Table 3. Doses for Group 2a (Essential amino acids) Medicinal Ingredients Doses Minimum/day Maximum/day 1 L-Histidine 49 mg 220 mg L-Isoleucine 66.5 mg 3.5 g L-Leucine 147 mg 7 g L-Lysine 133 mg 3 g L-Methionine 66.5 mg 1 g L-Phenylalanine 115.5 mg 339 mg L-Threonine 70 mg 301 mg L-Tryptophan 17.5 mg 220 mg L-Valine 84 mg 3.5 g Reference: Doses: Verhoeven et al. 2009; Guttuso et al. 2008; IOM 2005; Coombes and McNaughton 2000; Bassit et al. 2002; Plaitakis et al. 1988; Berry et al. 1982. 1 When combining individual amino acids with protein ingredients, the maximum total quantity (90 g) in Table 1 applies. Table 4. Doses for Group 2b (Non-essential amino acids) Medicinal Ingredients Doses Minimum/day Maximum/day 1 Maximum/single dose L-Alanine 181.5 mg 363 mg

N/A L-Arginine 208.5 mg 21 g 8 g L-Asparagine 4.6 mg 93.5 mg N/A L-Aspartic acid 325 mg 1 g N/A beta-Alanine 240 mg 6.4 g 3.2 g L-Citrulline 150 mg 6 g 3 g L-Cysteine 50 mg 1 g N/A L-Glutamic acid 750 mg 1.5 g N/A L-Glutamine 342.5 mg 9 g N/A Glycine 160 mg 1.8 g N/A L-Proline 259.5 mg 519 mg N/A L-Serine 175.5 mg 351 mg N/A L-Tyrosine 139 mg 3.6 g N/A

References: Doses: NNHPD 2024; Lenders et al. 2009; IOM 2005; Derave et al. 2007; Hill et al. 2007. 1 When combining individual amino acids with protein ingredients, the maximum total quantity (90 g) in Table 1 applies. Table 5. Doses for Group 3 (Carbohydrates)

Medicinal Ingredients	Doses	Minimum/day	Maximum/day	Maximum/single dose	Combined dose for all ingredients from Group 3 in the product
6.5 g	180 g	45 g			Reference: Dietitians of Canada 2013 Table 6. Doses, methods of preparation and uses or purposes for Group 4a (Non-caffeinated ergogenic agents)

Medicinal Ingredients Uses or purposes Methods of preparation Doses Minimum/day Maximum/day Maximum/single dose

Calcium beta- hydroxy-beta-methylbutyrate	Enhances muscle strength in previously untrained individuals in combination with intense resistance training exercise	N/A	3 g	6 g	N/A
L-Carnitine	Muscle recovery, Muscle tissue repair, Workout support/supplement	N/A	1 g	4 g	2 g
	Physical performance, Fatigue, Workout support/supplement combined with Physical performance/Fatigue	2 g			
Fat metabolism, Fat oxidation	3 g				

Eleutherococcus senticosus Used in Herbal Medicine to help improve physical performance after periods of physical exertion Dry, Powdered, Non-Standardized Extracts (Dry extract, Tincture, Fluid extract, Decoction, Infusion) 0.91 g of dried root 6 g of dried root N/A

Panax ginseng Used in Herbal Medicine to help enhance physical capacity/performance (in cases of physical stress) Dry, Powdered, Non-Standardized Extracts (Dry extract, Tincture, Fluid extract, Decoction, Infusion) 0.5 g of dried root/rootlets 9 g of dried root/rootlets N/A

Standardized extracts (Dry extract) 200 mg of extract standardized to 4-7% of total ginsenosides; Not to exceed 9 g of dried root/rootlets per day 600 mg of extract standardized to 4-7% of total ginsenosides; Not to exceed 9 g of dried root/rootlets per day N/A

References: Doses: CaHMB: Rowlands and Thomson 2009; Gallagher et al. 2000a,b. Carnitine: Wall et al. 2011; Ho et al. 2010; Spiering et al. 2008; Spiering et al. 2007; Stephens et al. 2007; Kraemer et al. 2006; Karlic and Lohninger 2004; Wutzke and Lorenz 2004; Kraemer et al. 2003; Müller et al. 2002; Volek et al. 2002; Benvenga et al. 2001; Cha et al. 2001; Ahmet et al. 2000; Arenas et al. 1994; Huertas et al. 1992; Arenas et al. 1991; Vecchiet et al. 1990; Harper et al. 1988; Marconi et al. 1985. Eleuthero : Bradley 2006; ESCOP 2003; Hoffmann 2003; Blumenthal et al. 2000; Mills and Bone 2000. Panax ginseng : Vuksan et al. 2008; Reay et al. 2006; Sievenpiper et al. 2006; Reay et al. 2005; Sünram-Lea et al. 2005; Kennedy et al. 2004; ESCOP 2003; Kennedy et al. 2002; Scholey and Kennedy 2002; Engels et al. 2001; Kennedy et al. 2001; Scaglione et al. 2001; Blumenthal et al. 2000; Tetsutani et al. 2000; Engels et al. 1996; Scaglione et al. 1996; Gross et al. 1995; Scaglione et al. 1994; Scaglione et al. 1990; Petkov and Mosharrof 1987; D'Angelo et al. 1986; Soldati and Sticher 1980. Note: When 'decoction' or 'infusion' is listed as an acceptable method of preparation, 'decoction concentrate' or 'infusion concentrate' is also allowed. Table 7. Dose(s) for creatine monohydrate (with loading phase) Loading Phase Maintenance Phase Min/day Max/day Max/single dose Min/day Max/day Option 1 15 g 20 g 5 g 2 g 5 g Option 2 3 g 5 g N/A

Table 8. Dose(s) for creatine monohydrate (no loading phase) Min/day Max/day Option 3 3 g 5 g

References for Tables 7 and 8: Okudan and Gökbel 2005; Preen et al. 2003; Bembien et al. 2001; Volek et al. 1999; Vandenberghe et al. 1997; Hultman et al. 1996. Table 9. Doses for Group 4b (Caffeine) 1 Medicinal Ingredient Doses Min/day Max/day Min/single dose Max/single dose Caffeine 100 mg 400 mg 100 mg 200 mg

Reference: HC 2022. 1 Maximum daily dose of 1000 milligrams from NNHPD Caffeine monograph does not apply for Workout Supplements as this maximum dose is not acceptable for prolonged use. Table 10. Doses for Group 5 (Vitamins and Minerals)

Medicinal Ingredients	Doses	Vitamins and Minerals
As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph	Table 11. Doses and methods of preparation for Group 6 (Complementary ingredients)	

Medicinal ingredients	Methods of preparation	Doses	Minimum/day	Maximum/day	Agmatine
N/A	> 0 mg	2 g			
Choline	N/A	> 0 mg	1 g		
Capsicum annuum	Dry, Powdered, Non-Standardized Extracts (Dry extract*, Tincture, Fluid Extract, Decoction, Infusion)	> 0 mg	dried fruit	650 mg	dried fruit
Deanol	N/A	> 0 mg	750 mg		
Lycopene	N/A	> 0 mg	30 mg		
L-Ornithine	N/A	> 0 mg	1.5 g		
Malpighia glabra	Dry, Powdered, Non-Standardized Extracts (Dry extract*, Tincture, Fluid Extract, Decoction, Infusion)	> 0 mg	dried or fresh fruit	10 g	dried fruit
100 g	of fresh fruit	Piper nigrum	Powdered	1	> 0 mg
dried fruit	25 mg	of dried fruit	Piperine	N/A	> 0 mg
14 mg					
Taurine	N/A	> 0 mg	3 g		

References: Doses: CNF 2024; NNHPD 2024; Wong et al. 2016; Figueroa et al. 2015; Kenyan et al. 2010; TGA 2007; de Montigny et al. 1979; Marsh and Linnoila 1979; Caraceni et al. 1978; Penovich et al. 1978. 1 The method of preparation 'powdered' is defined as a dried and ground preparation (= unextracted). Note: \*For Capsicum annuum and Malpighia glabra , solvents allowed for the method of preparation "Non-standardized extracts (Dry extract)" as part of this monograph are ethanol and/or water only. When 'decoction' or 'infusion' is listed as an acceptable method of preparation, 'decoction concentrate' or 'infusion concentrate' is also allowed. Direction(s) for use All products (optional) Ensure to drink optimal fluid before, during, and after exercise. Products containing creatine monohydrate and making creatine claims

Table 12. Direction(s) for use and duration(s) of use Option(s) 1 Direction(s) for use and duration(s) of use Option 1 - loading phase of 15-20 g/day Start with a loading phase of X g 2 per day for 5-7 days and follow with a

maintenance phase (Y g 2 /day) Option 2 - loading phase of 3-5 g/day Start with a loading phase of X g 2 per day for a minimum of 4 weeks and follow with a maintenance phase (Y g 2 /day) Option 3 - no loading phase Use for a minimum of 4 weeks. Reference: NNHPD 2024. 1 If more than one option is listed for a product, they should be separated with 'OR' for clarity. 2 The dose in grams can be replaced on the label with the number of dosage unit required to reach the loading dose (X g) and the maintenance dose (Y g) (e.g. X scoop(s); sachet(s); serving(s), etc). The values for X and Y must be listed on the PLA for as an additional direction for use statement (e.g., X = 15 g and Y = 5 g). Products containing L-carnitine and making Muscle recovery, Muscle tissue repair, Workout/Athletic support/supplement, Physical performance, or Fatigue claims Take 2-4 hours prior to exercise (Harper et al. 1988). Products providing more than 200 mg of caffeine, per day (i.e. to be taken in divided doses) Wait 3 to 4 hours between each dose Products containing whey protein Take a few hours before or after taking other medications or health products (Sweetman 2011; Jung et al. 1997). Products in powder form (Thoroughly) Mix product in enough liquid (water, juice, etc.) immediately before consumption. Products for increasing exercise performance (optional) Consume 45-90 minutes before exercising (Aragon and Schoenfeld 2013). Products for repairing body tissues/muscles and restoring plasma glutamine levels (optional) Consume no later than 90 minutes after exercising (Aragon and Schoenfeld 2013). Products for endurance based on ingredients from Group 3 (Carbohydrates) (optional) Consume 30-60 grams of carbohydrates, per hour of high intensity exercise (Saunders et al. 2007; Ivy et al. 2003). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Combinations rules All ingredients included in this monograph may be combined together, across all Groups. The finished product should not exceed a total amount of piperine (from Piper nigrum (black pepper) and/or isolated piperine)) of 14 mg per day. For combination of Whey protein isolate, Whey protein concentrate and Whey protein hydrolysate, consult the NNHPD Whey products monograph. Duration(s) of Use Products providing more than 200 mg of agmatine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 3 weeks (Gilad and Gilad 2014; Kenyan et al. 2010). Products providing 3 g or more of L-arginine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 8 weeks if you have a cardiovascular disease (Salmani et al. 2021; Sydow et al. 2002; Hambrecht et al. 2000; Clarkson et al.1996; Rector et al. 1996). Products providing more than 9 g and up to 14 g of L-arginine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 6 months (De Nicola et al. 1999). Products providing more than 14 g of L-arginine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 12 weeks (Tangphao et al. 1999). Note: Durations of use can be combined on the label (e.g., Ask a health care practitioner for use beyond 6 months, or beyond 8 weeks if you have a cardiovascular disease). Products providing more than 3 g of L-citrulline, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 8 weeks (Harnden et al. 2023; Xie et al. 2023; Smeets et al. 2022; Viribay et al. 2022; Rhim et al 2020; Behpour et al. 2020; Wong et al. 2016; Figueroa et al. 2015). Product providing more than 3 g of beta-alanine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 10 weeks (Derave et al. 2007; Hill et al. 2007). Products containing deanol Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 4 weeks (de Montigny et al. 1979, Marsh and Linnoila 1979, Caraceni et al. 1978. Penovich et al. 1978). Products containing eleuthero Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 4 weeks (ESCAP 2003). Products containing Panax ginseng Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 12 weeks (Bradley 2006; Mills and Bone 2005; Blumenthal et al. 2000). Products containing piperine Ask a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 12 weeks (Lieberman et al. 2005). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Risk Information Caution(s) and warning(s) All products (except products containing deanol requiring a contraindication) Ask a healthcare practitioner/health care provider/health care professional/doctor/physician before use if you are pregnant or breastfeeding. Products containing milk by-products (such as casein, hydrolyzed casein, casein micelles, whey and milk proteins sourced from Bos taurus milk) Contains milk by-products. Products providing more than 30 g total protein and/or amino acids (including beta-alanine), per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a liver or kidney disorder (Shils et al. 2006). Products containing 40 mg to 400 mg caffeine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have high blood pressure or glaucoma (Cornelis and El-Sohemy 2007, Chandrasekaran et al. 2005, Noordzij et al. 2005, Avisar et al. 2002, Arya et al. 2000, Jee et al. 1999, Creighton and Stanton 1990). Products providing more than 300 mg of caffeine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are attempting to conceive (Nawrot et al. 2003). Products providing 400 mg caffeine, per day When using this product avoid taking other health products, foods or

beverages that contain caffeine and/or increase blood pressure (FDA 2023; Bui et al. 2006; Bouchard et al. 2005; Haller et al. 2005; NIH 2004; Berardi et al. 2002; Vahedi et al. 2000; Zimmerman 1992). Products containing CaHMB Ask a health care practitioner /health care provider/health care professional/doctor/physician before use if you are taking cholesterol medications (Nissen et al. 2000). Products containing cayenne Keep out of reach of children. If overdose or accidental ingestion occurs, call a poison control center immediately (CPS 2008). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a stomach ulcer or inflammation (Brinker 2010; Bradley 2006; Boon and Smith 2004). Products containing creatine monohydrate Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a kidney disorder (Pline and Smith 2005; Pritchard and Kalra 1998). When using this product you may gain weight (Volek and Rawson 2004; Bembien et al. 2001; Mihic et al. 2000). Products providing more than 200 mg of agmatine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a mood/affective or psychiatric disorder, diabetes or a cardiovascular disease (Freitas et al. 2016; Nissim et al. 2014; Payandemehr et al. 2013; Piletz et al. 2013; Shopsin 2013; Uzbay et al. 2013; Su et al. 2003). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking antidepressant or opioid analgesic medications (Freitas et al. 2016; Payandemehr et al. 2013; Shopsin 2013; Uzbay et al. 2013; Su et al. 2003). Products providing more than 0.42 g of L-arginine and/or L-citrulline, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a cardiovascular disease and are attempting an increase in physical activity (Doutreleau et al. 2010; Doutreleau et al. 2006; Schulman et al. 2006; Nagaya et al. 2001; Bednarz et al. 2000; Ceremuzynski et al. 1997; Rector et al. 1996). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking medication for cardiovascular diseases, erectile dysfunction, and/or blood thinners (Huynh et al. 2002; Parker et al. 2002; Siani et al. 2000; Adams et al. 1995). Products containing L-tryptophan Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking antidepressants (Boyer 2023; Scotton et al. 2019; Erner 2003). Products containing L-carnitine Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a seizure disorder (CPS 2008). Products containing deanol Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking cholinergic or anticholinergic drugs (NIEHS 2002; de Montigny et al. 1979). Ask a health care practitioner/health care provider/health care professional/doctor/physician if you have a psychological disorder (NIEHS 2002; Casey 1979; de Montigny et al. 1979). Products containing eleuthero Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have an acute infection (Brinker 2010; Barnes et al. 2007; ESCOP 2003; Mills and Bone 2000). Products containing Panax ginseng Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have diabetes (Brinker 2010; Vuksan et al. 2008; Seely et al. 2008; Sievenpiper et al. 2006; ESCOP 2003; Tetsutani et al. 2000; Sotaniemi et al. 1995; Chin 1991). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking antidepressant medication, blood thinners or digoxin (Brinker 2010; Lee et al. 2008a; Dasgupta and Reyes 2005; Janetzki and Morreale 1997; Gonzalez-Seijo et al. 1995; Shader and Greenblatt 1988; Jones and Runikis 1987; Shader and Greenblatt 1985). Products containing piperine Ask a health care practitioner /health care provider/health care professional/doctor/physician before use if you are taking medications or any other health products, as piperine may alter their effectiveness (Han 2011; Srinivasan 2007; Khajuria et al. 2002; Bano et al. 1991). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Contraindication(s) Products providing more than 9 g of L-arginine, per day Do not use if you have had a heart attack/myocardial infarction (Sun et al. 2009; Schulman et al. 2006; Bednarz et al. 2005). Products containing deanol Do not use if you are pregnant or breastfeeding (NIEHS 2002). Products containing eleuthero Do not use if you have high blood pressure (Brinker 2010; Barnes et al. 2007; Blumenthal et al. 2000; Mills and Bone 2000; McGuffin et al. 1997). Products containing whey proteins and providing 100 mg or more potassium, per day Do not use if you are taking other potassium-containing salt-substitutes or supplements (Sweetman 2011). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Known adverse reaction(s) Products containing beta-alanine When using this product reduce the dose if flushing, tingling or prickling sensation of the skin occurs (Harris et al. 2006; Hill et al. 2007; Jordan et al. 2010) Products containing deanol Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if you experience drowsiness, confusion, headache, changes in mood, nausea, or gastrointestinal disorders (NIEHS 2002; Casey 1979; Marsh and Linnoila 1979; de Montigny et al. 1979) Products containing caffeine at any dose Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if hypersensitivity/allergy occurs (Infante et al. 2003; Hinrichs et al. 2002). Products providing 40 mg to 400 mg caffeine, per day When using this product diuretic effect may occur. Products providing 200 mg or more caffeine, per day Stop use and ask a health care practitioner/health



care provider/health care professional/doctor/physician if symptoms such as chest pain and irregular heartbeat occur (Higgins and Babu 2013). Products providing more than 200 mg of agmatine, per day or more than 9 g of L-arginine, per day or more than 30 g of protein and/or amino acids, per day When using this product you may experience gastrointestinal discomfort/disturbances (Keynan et al. 2010; Grimble 2007; Evans et al. 2004; Clarkson et al. 1996). Products containing Panax ginseng Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if you experience insomnia, anxiety or headaches (Lee et al. 2008b; Vuksan et al 2008; de Andrade et al. 2007; Sievenpiper et al. 2006; Coon and Ernst 2002; Ellis and Reddy 2002; Scaglione et al. 2001; Siegel 1979). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Non-medicinal ingredients Must be chosen from the current Natural Health Products Ingredients Database (NHPID) and must meet the limitations outlined in the database. Storage conditions Must be established in accordance with the requirements described in the Natural Health Products Regulations. Specifications The finished product specifications must be established in accordance with the requirements described in the Natural and Non-prescription Health Products Directorate (NNHPD) Quality of Natural Health Products Guide. The medicinal ingredient must comply with the requirements outlined in the NHPID. Hemp seed protein concentrate and Hemp seed protein isolate This monograph is for Cannabis sativa seed protein from hemp only. Hemp is defined in the Industrial Hemp regulations (IHR) as “ a cannabis plant — or any part of that plant — in which the concentration of THC is 0.3% w/w or less in the flowering heads and leaves ”. Approved hemp cultivars are set out in the List of Approved Cultivars, published by the Government of Canada on its website, as amended from time to time. Additional cultivars may be permitted such as those on the Association of Official Seed Certifying Agencies ( AOSCA ) list which also meet the definition of Hemp set out in the IHR. Products containing hemp seed protein concentrate or hemp seed protein isolate must not contain more than 10 parts per million delta-9-Tetrahydrocannabinol (THC), or phytocannabinoids that have been isolated or concentrated, or synthetic duplicates of phytocannabinoids. The determination of the THC concentration must take into account the potential to convert delta-9-tetrahydrocannabinolic acid (THCA) to THC. Creatine monohydrate The finished product and/or raw material specifications must meet the process-related impurity acceptance criteria outlined in the USP Creatine monograph (or any other internationally recognized pharmacopoeia). Note that the NNHPD will accept these process-related impurity acceptance criteria for either the finished product or the raw material; however, the procedures described in the USP Creatine monograph are specific to the testing of creatine monohydrate as raw material. As per the NNHPD Quality of Natural Health Products Guide, if alternate methods are used for testing to meet pharmacopoeial specifications, the relevant pharmacopoeia should be consulted for information on whether or not the alternate methods are considered suitable. Soy protein concentrate/isolate For an accurate measure of specific isoflavones in AIE, follow the methods outlined in AOAC 2008.03 (Collison 2008).

**EXAMPLE OF PRODUCT FACTS:** Consult the Guidance Document, Labelling of Natural Health Products for more details. References Cited Adams MR, Forsyth CJ, Jessup W, Robinson J, Celermajor DS. Oral L-arginine inhibits platelet aggregation but does not enhance endothelium-dependent dilation in healthy young men. *Journal of the American College of Cardiology* 1995;26(4):1054-1061. Ahmet U, Abdurrahman K, Sait B, Ahmet E, Salih D, Mendane S, Ates Y, Fatih B, Necmettin K, Kemal D. L-carnitine therapy in non-alcoholic steatohepatitis. *Turkish Journal of Pediatrics* 2000;11(3):196-201. Aragon AA, Schoenfeld BJ. Nutrient timing revisited: is there a post-exercise anabolic window? *Journal of the International Society of Sports Nutrition* 2013;10(5). Arenas J, Huertas R, Campos Y, Diaz AE, Villalon JM, Vilas E. Effect of L-carnitine on the pyruvate dehydrogenase complex and carnitine palmitoyl transferase activities in muscle of endurance athletes. *FEBS Letters* 1994;341:91-93. Arenas J, Ricoy JR, Encinas AR, Pola P, D'Iddio S, Zeviani M, Didonato S, Corsi M. Carnitine in muscle, serum, and urine of nonprofessional athletes: Effects of physical exercise, training, and L-carnitine administration. *Journal of Muscle & Nerve* 1991;14(7):598-604. Arya LA, Myers DL, Jackson ND. Dietary caffeine intake and the risk for detrusor instability: a case-control study. *Obstetrics and Gynecology* 2000;96(1):85-89. Avisar R, Avisar E, Weinberger D. Effect of coffee consumption on intraocular pressure. *The Annals of Pharmacotherapy* 2002;36(6):992-995. Bailey SJ, Blackwell JR, Lord T, Vanhatalo A, Winyard PG, Jones AM. L-Citrulline supplementation improves O<sub>2</sub> uptake kinetics and high-intensity exercise performance in humans. *Journal of Applied Physiology* 2015;119(4):385-395. Bano G, Raina RK, Zutshi U, Bedi KL, Johri RK, Sharma SC. Effect of piperine on bioavailability and pharmacokinetics of propranolol and theophylline in healthy volunteers. *European Journal of Pharmacology* 1991;41(6):615-7. Barnes J, Anderson LA, Philipson JD. *Herbal Medicines*, 3rd edition. London (UK): The Pharmaceutical Press; 2007. Bassit RA, Sawada LA, Bacurau RFP, Navarro F, Martins Jr E, Santos RVT, Caperuto EC, Rogeri P, Costa Rosa LFBP. Branched-chain amino acid supplementation and the immune response of long-distance athletes. *Nutrition* 2002;18(5):376-379. Bednars B, Jaxa-Chamiec T, Maciejewski P, Szpajer M, Janik K, Gniot J, Kawka-Urbaneck T, Drozdowska D, Gessek J, Laskowski H. Efficacy and safety of oral L-arginine in acute myocardial infarction. Results of the multicenter, randomized, double-blind, placebo-controlled ARAMI pilot trial. *Kardiologia Polska*. 2005;62(5):421-427. Bednars B, Wolk R, Chamiec T, Herbaczynska-Cedro K, Winek D, Ceremuzynski L. Effects of oral L-arginine



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## **DOSAGE FORM(S)**

Acceptable dosage forms for oral use are indicated in the dosage form drop-down list of the web-based Product Licence Application form for Compendial applications. Note Liquids and solutions are not permitted for products containing Creatine monohydrate, due to lack of stability of the finished product (Dash and Sawhney 2002).

## **USE(S) OR PURPOSE(S)**

Notes: The above uses can be combined on the product label (e.g. Helps temporarily to relieve fatigue and to assist in muscle cell repair after exercise).The terms 'Helps' or 'Helps to' can be used interchangeably on the label.



## RISK INFORMATION

Caution(s) and warning(s) All products (except products containing deanol requiring a contraindication) Ask a healthcare practitioner/health care provider/health care professional/doctor/physician before use if you are pregnant or breastfeeding. Products containing milk by-products (such as casein, hydrolyzed casein, casein micelles, whey and milk proteins sourced from *Bos taurus* milk) Contains milk by-products. Products providing more than 30 g total protein and/or amino acids (including beta-alanine), per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a liver or kidney disorder (Shils et al. 2006). Products containing 40 mg to 400 mg caffeine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have high blood pressure or glaucoma (Cornelis and El-Sohemy 2007, Chandrasekaran et al. 2005, Noordzij et al. 2005, Avisar et al. 2002, Arya et al. 2000, Jee et al. 1999, Creighton and Stanton 1990). Products providing more than 300 mg of caffeine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are attempting to conceive (Nawrot et al. 2003). Products providing 400 mg caffeine, per day When using this product avoid taking other health products, foods or beverages that contain caffeine and/or increase blood pressure (FDA 2023; Bui et al. 2006; Bouchard et al. 2005; Haller et al. 2005; NIH 2004; Berardi et al. 2002; Vahedi et al. 2000; Zimmerman 1992). Products containing CaHMB Ask a health care practitioner /health care provider/health care professional/doctor/physician before use if you are taking cholesterol medications (Nissen et al. 2000). Products containing cayenne Keep out of reach of children. If overdose or accidental ingestion occurs, call a poison control center immediately (CPS 2008). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a stomach ulcer or inflammation (Brinker 2010; Bradley 2006; Boon and Smith 2004). Products containing creatine monohydrate Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a kidney disorder (Pline and Smith 2005; Pritchard and Kalra 1998). When using this product you may gain weight (Volek and Rawson 2004; Bembien et al. 2001; Mihic et al. 2000). Products providing more than 200 mg of agmatine, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a mood/affective or psychiatric disorder, diabetes or a cardiovascular disease (Freitas et al. 2016; Nissim et al. 2014; Payandemehr et al. 2013; Piletz et al. 2013; Shopsin 2013; Uzbay et al. 2013; Su et al. 2003). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking antidepressant or opioid analgesic medications (Freitas et al. 2016; Payandemehr et al. 2013; Shopsin 2013; Uzbay et al. 2013; Su et al. 2003). Products providing more than 0.42 g of L-arginine and/or L-citrulline, per day Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a cardiovascular disease and are attempting an increase in physical activity (Doutreleau et al. 2010; Doutreleau et al. 2006; Schulman et al. 2006; Nagaya et al. 2001; Bednarz et al. 2000; Ceremuzynski et al. 1997; Rector et al. 1996). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking medication for cardiovascular diseases, erectile dysfunction, and/or blood thinners (Huynh et al. 2002; Parker et al. 2002; Siani et al. 2000; Adams et al. 1995). Products containing L-tryptophan Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking antidepressants (Boyer 2023; Scotton et al. 2019; Erner 2003). Products containing L-carnitine Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have a seizure disorder (CPS 2008). Products containing deanol Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking cholinergic or anticholinergic drugs (NIEHS 2002; de Montigny et al. 1979). Ask a health care practitioner/health care provider/health care professional/doctor/physician if you have a psychological disorder (NIEHS 2002; Casey 1979; de Montigny et al. 1979). Products containing eleuthero Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have an acute infection (Brinker 2010; Barnes et al. 2007; ESCOP 2003; Mills and Bone 2000). Products containing Panax ginseng Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you have diabetes (Brinker 2010; Vuksan et al. 2008; Seely et al. 2008; Sievenpiper et al. 2006; ESCOP 2003; Tetsutani et al. 2000; Sotaniemi et al. 1995; Chin 1991). Ask a health care practitioner/health care provider/health care professional/doctor/physician before use if you are taking antidepressant medication, blood thinners or digoxin (Brinker 2010; Lee et al. 2008a; Dasgupta and Reyes 2005; Janetzki and Morreale 1997; Gonzalez-Seijo et al. 1995; Shader and Greenblatt 1988; Jones and Runikis 1987; Shader and Greenblatt 1985). Products containing piperine Ask a health care practitioner /health care provider/health care

professional/doctor/physician before use if you are taking medications or any other health products, as piperine may alter their effectiveness (Han 2011; Srinivasan 2007; Khajuria et al. 2002; Bano et al. 1991). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Contraindication(s) Products providing more than 9 g of L-arginine, per day Do not use if you have had a heart attack/myocardial infarction (Sun et al. 2009; Schulman et al. 2006; Bednarz et al. 2005). Products containing deanol Do not use if you are pregnant or breastfeeding (NIEHS 2002). Products containing eleuthero Do not use if you have high blood pressure (Brinker 2010; Barnes et al. 2007; Blumenthal et al. 2000; Mills and Bone 2000; McGuffin et al. 1997). Products containing whey proteins and providing 100 mg or more potassium, per day Do not use if you are taking other potassium-containing salt-substitutes or supplements (Sweetman 2011). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph. Known adverse reaction(s) Products containing beta-alanine When using this product reduce the dose if flushing, tingling or prickling sensation of the skin occurs (Harris et al. 2006; Hill et al. 2007; Jordan et al. 2010) Products containing deanol Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if you experience drowsiness, confusion, headache, changes in mood, nausea, or gastrointestinal disorders (NIEHS 2002; Casey 1979; Marsh and Linnoila 1979; de Montigny et al. 1979) Products containing caffeine at any dose Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if hypersensitivity/allergy occurs (Infante et al. 2003; Hinrichs et al. 2002). Products providing 40 mg to 400 mg caffeine, per day When using this product diuretic effect may occur. Products providing 200 mg or more caffeine, per day Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if symptoms such as chest pain and irregular heartbeat occur (Higgins and Babu 2013). Products providing more than 200 mg of agmatine, per day or more than 9 g of L-arginine, per day or more than 30 g of protein and/or amino acids, per day When using this product you may experience gastrointestinal discomfort/disturbances (Keynan et al. 2010; Grimble 2007; Evans et al. 2004; Clarkson et al. 1996). Products containing Panax ginseng Stop use and ask a health care practitioner/health care provider/health care professional/doctor/physician if you experience insomnia, anxiety or headaches (Lee et al. 2008b; Vuksan et al. 2008; de Andrade et al. 2007; Sievenpiper et al. 2006; Coon and Ernst 2002; Ellis and Reddy 2002; Scaglione et al. 2001; Siegel 1979). Products containing vitamins and/or minerals As per the current NNHPD Multi-Vitamin/Mineral Supplements Monograph.

## **STORAGE CONDITION(S)**

Must be established in accordance with the requirements described in the Natural Health Products Regulations.

## **SPECIFICATIONS**

The finished product specifications must be established in accordance with the requirements described in the Natural and Non-prescription Health Products Directorate (NNHPD) Quality of Natural Health Products Guide. The medicinal ingredient must comply with the requirements outlined in the NHPID. Hemp seed protein concentrate and Hemp seed protein isolate This monograph is for Cannabis sativa seed protein from hemp only. Hemp is defined in the Industrial Hemp regulations (IHR) as “a cannabis plant — or any part of that plant — in which the concentration of THC is 0.3% w/w or less in the flowering heads and leaves”. Approved hemp cultivars are set out in the List of Approved Cultivars, published by the Government of Canada on its website, as amended from time to time. Additional cultivars may be permitted such as those on the Association of Official Seed Certifying Agencies (AOSCA) list which also meet the definition of Hemp set out in the IHR. Products containing hemp seed protein concentrate or hemp seed protein isolate must not contain more than 10 parts per million delta-9-Tetrahydrocannabinol (THC), or phytocannabinoids that have been isolated or concentrated, or synthetic duplicates of phytocannabinoids. The determination of the THC concentration must take into account the potential to convert delta-9-tetrahydrocannabinolic acid (THCA) to THC. Creatine monohydrate The finished product and/or raw material specifications must meet the process-related impurity acceptance criteria outlined in the USP Creatine monograph (or any other internationally recognized pharmacopoeia). Note that the NNHPD will accept these process-related impurity acceptance criteria for either the finished product or the raw material; however, the procedures described in the USP Creatine monograph

are specific to the testing of creatine monohydrate as raw material. As per the NNHPD Quality of Natural Health Products Guide, if alternate methods are used for testing to meet pharmacopoeial specifications, the relevant pharmacopoeia should be consulted for information on whether or not the alternate methods are considered suitable. Soy protein concentrate/isolate For an accurate measure of specific isoflavones in AIE, follow the methods outlined in AOAC 2008.03 (Collison 2008). EXAMPLE OF PRODUCT FACTS:

## REFERENCES

1When combining individual amino acids with protein ingredients, the maximum total quantity (90 g) in Table 1 applies.

Table 5. Doses for Group 3 (Carbohydrates)	Medicinal Ingredients	Doses	Minimum/day	Maximum/day	Maximum/single dose	Combined dose for all ingredients from Group 3 in the product
6.5 g	180 g	45 g	Reference: Dietitians of Canada 2013	Table 6. Doses, methods of preparation and uses or purposes for Group 4a (Non-caffeinated ergogenic agents)	Medicinal Ingredients	Uses or purposes
Methods of preparation	Doses	Minimum/day	Maximum/day	Maximum/single dose	Calcium beta-hydroxy-beta-methylbutyrate	Enhances muscle strength in previously untrained individuals in combination with intense resistance training exercise
N/A	3 g	6 g	N/A	AL-Carnitine	Muscle recovery, Muscle tissue repair, Workout support/supplement	N/A
1 g	2 g	2 g	Physical performance, Fatigue, Workout support/supplement combined with Physical performance/Fatigue	2 g	Fat metabolism, Fat oxidation	3 g
Eleutherococcus senticosus	Used in Herbal Medicine to help improve physical performance after periods of physical exertion	Dry, Powdered, Non-Standardized Extracts (Dry extract, Tincture, Fluid extract, Decoction, Infusion)	0.91 g of dried root	6 g of dried root	N/A	Panax ginseng
Used in Herbal Medicine to help enhance physical capacity/performance (in cases of physical stress)	Dry, Powdered, Non-Standardized Extracts (Dry extract, Tincture, Fluid extract, Decoction, Infusion)	0.5 g of dried root/rootlets	9 g of dried root/rootlets	N/A	Standardized extracts (Dry extract)	200 mg of extract standardized to 4-7% of total ginsenosides; Not to exceed 9 g of dried root/rootlets per day
600 mg of extract standardized to 4-7% of total ginsenosides; Not to exceed 9 g of dried root/rootlets per day	N/A	References: Doses: CaHMB: Rowlands and Thomson 2009; Gallagher et al. 2000a,b. Carnitine: Wall et al. 2011; Ho et al. 2010; Spiering et al. 2008; Spiering et al. 2007; Stephens et al. 2007; Kraemer et al. 2006; Karlic and Lohninger 2004; Wutzke and Lorenz 2004; Kraemer et al. 2003; Müller et al. 2002; Volek et al. 2002; Benvenga et al. 2001; Cha et al. 2001; Ahmet et al. 2000; Arenas et al. 1994; Huertas et al. 1992; Arenas et al. 1991; Vecchiet et al. 1990; Harper et al. 1988; Marconi et al. 1985. Eleuthero : Bradley 2006; ESCOP 2003; Hoffmann 2003; Blumenthal et al. 2000; Mills and Bone 2000. Panax ginseng : Vuksan et al. 2008; Reay et al. 2006; Sievenpiper et al. 2006; Reay et al. 2005; Sünram-Lea et al. 2005; Kennedy et al. 2004; ESCOP 2003; Kennedy et al. 2002; Scholey and Kennedy 2002; Engels et al. 2001; Kennedy et al. 2001; Scaglione et al. 2001; Blumenthal et al. 2000; Tetsutani et al. 2000; Engels et al. 1996; Scaglione et al. 1996; Gross et al. 1995; Scaglione et al. 1994; Scaglione et al. 1990; Petkov and Mosharrof 1987; D'Angelo et al. 1986; Soldati and Sticher 1980. Note:When 'decoction' or 'infusion' is listed as an acceptable method of preparation, 'decoction concentrate' or 'infusion concentrate' is also allowed.				

	Common name(s)	Source information		
	Source material(s)	Part(s)		
	House cricket	N/A	Acheta domesticus	Whole
	Alfalfa protein concentrate	N/A	Medicago sativa	Herb to
	Beef protein isolate	N/A	Bos taurus	Muscle
	Casein	Acid caseinCalcium caseinateCalcium sodium caseinate	Bas taurus	Milk
Casein	Casein hydrolysateHydrolyzed casein	N/A	Bos taurus	Milk
	Micellar casein	N/A	Bas taurus	Milk
	Chia protein concentrate	N/A	Salvia hispanica	Seed
	Chia protein isolate	N/A	Salvia hispanica	Seed

	Chickpea protein concentrate	N/A	Cicer arietinum	Seed
	Chickpea protein isolate	N/A	Cicer arietinum	Seed
	Chick-peaGarbanzo	N/A	Cicer arietinum	Seed
	Coconut protein concentrate	N/A	Cocos nucifera	Seed e
	Coconut protein isolate	N/A	Cocos nucifera	Seed e
	Acorn squashBitter bottle gourdGhia kaddumMarrowPumpkinSquash	N/A	Cucurbita pepo	Seed
	Defatted wheat germ protein	N/A	Triticum aestivum	Seed g
	Fava bean protein concentrate	N/A	Vicia faba	Seed
	Fava bean protein isolate	N/A	Vicia faba	Seed
	Fish protein hydrolysate	N/A	Clupea harengus	EggFis
	MeatMuscle			
	Meat			
	Meat			
	MeatMuscle			
	Meat			
	Meat			
	Meat			
	Flaxseed protein	N/A	Linum usitatissimum	Seed
	Tropical house cricket	N/A	Gryllodes sigillatus	Whole
	Hemp protein concentrate	N/A	Cannabis sativa	Non-vi
	Hemp protein isolate	N/A	Cannabis sativa	Non-vi
	Common duckweed	N/A	Lemna minor	Whole
	Lentil protein concentrate	N/A	Lens culinaris	Seed
	GramLentil	N/A	Lens culinaris	Seed
	FlaxFlaxseedLinseed	N/A	Linum usitatissimum	Seed
	AlfalfaLucerne	N/A	Medicago sativa	Herb to
	Milk protein concentrate	N/A	Bos taurus	Milk
	Milk protein isolate	N/A	Bos taurus	Milk
	Asian riceBlack ricePurple riceRice	N/A	Oryza sativa	Seed
	Pea protein concentrate	N/A	Pisum sativum	Seed
	Pea protein isolate	N/A	Pisum sativum	Seed
	Pea	N/A	Pisum sativum	Seed
rotein	Inca peanut proteinSacha inchi protein	N/A	Plukenetia volubilis	Seed
	Inca-peanutSacha incheSacha inchi	N/A	Plukenetia volubilis	Seed
n	Potato proteinPotato tuber protein	N/A	Solanum tuberosum	Tuber
e	Pumpkin seed protein concentrate	N/A	Cucurbita pepo	Seed
	Rice protein concentrate	N/A	Oryza sativa	Seed
	Chia	N/A	Salvia hispanica	Seed
	Soy protein concentrate	N/A	Glycine max	Seed

	Soy protein isolate	N/A	Glycine max	Seed
	Fava bean	N/A	Vicia faba	Seed
	Water lentil protein concentrate	N/A	Lemna minorWolffia globosa	Whole
	Wheat protein isolate	N/A	Triticum aestivum	Seed g
	Whey protein concentrate	N/A	Bos taurusCapra hircus	Milk
	Whey protein hydrolysate	N/A	Bos taurusCapra hircus	Milk
	Whey protein isolate	N/A	Bos taurusCapra hircus	Milk
	Asian watermeal	N/A	Wolffia globosa	Whole

Proper name(s)	Common name(s)	Source information
Source ingredient(s)		
(S)-alpha-Amino-1H-imidazole-4-propanoic acidL-Histidine	L-Histidine	L-HistidineL-Histidine hydrochloride
(2S,3S)-2-Amino-3-methylpentanoic acidL-Isoleucine	L-Isoleucine	L-IsoleucineL-Isoleucine ethyl esterL-Isoleucine ethyl es
(S)-2-Amino-4-methylpentanoic acidL-Leucine	L-Leucine	L-Leucine hydrochlorideL-LeucineL-Leucine ethyl esterL
(S)-2,6-Diaminohexanoic acidL-Lysine	L-LysineLysine	L-LysineL-Lysine-L-aspartateL-Lysine monohydrochlori
(S)-2-Amino-4-(methylthio)butanoic acidL-Methionine	MethionineMethionine	DL-MethionineL-MethionineN-Acetyl-L-methionine
(S)-2-Amino-3-phenylpropanoic acidL-Phenylalanine	L-Phenylalanine	DL-PhenylalanineL-PhenylalanineL-Phenylalanine meth
(2S,3R)-2-Amino-3-hydroxybutyric acidL-Threonine	L-Threonine	DL-ThreonineL-Threonine
(S)-alpha-Amino-1H-indole-3-propanoic acidL-Tryptophan	L-Tryptophan	L-Tryptophan
(S)-2-Amino-3-methylbutanoic acidL-Valine	L-Valine	DL-ValineL-ValineL-Valine ethyl esterL-Valine ethyl este

Proper name(s)	Common name(s)	Source information
Source ingredient(s)		
(S)-2-Aminopropanoic acidL-Alanine	L-Alanine	AlanylglutamineDL-AlanineL-AlanineL-Alanine ethyl e
3-Aminopropanoic acid3-Aminopropionic acidbeta-Alanine	beta-Alanine	beta-Alaninebeta-Alanine ethyl ester
(S)-2-Amino-5-[(aminoiminomethyl) amino] pentanoic acidL-Arginine	L-Arginine	DL-ArginineL-ArginineL-Arginine alpha-ketoglutarate
(S)-2,4-Diamino-4-oxobutanoic acidL-Asparagine	L-Asparagine	L-Asparagine
(S)-Aminobutanedioic acidL-Aspartic acid	L-Aspartic acid	L-Aspartic acidPotassium aspartatePotassium magn
(S)-N5-CarbamoylornithineL-CitrullineN5-(Aminocarbonyl)ornithine	L-Citrulline	L-Citrulline ethyl esterL-Citrulline malateL-Citrulline
(R)-2-Amino-3-mercaptopropanoic acidL-Cysteine	L-Cysteine	L-Cysteine hydrochlorideL-Cysteine hydrochloride m
(S)-2-Aminopentanedioic acidL-Glutamic acid	L-GlutamateL-Glutamic acid	L-Glutamic acid hydrochlorideL-Glutamic acidMonos
(S)-2,5-Diamino-5-oxopentanoic acidL-Glutamine	L-Glutamine	L-GlutamineL-Glutamine ethyl ester
Aminoacetic acid	Glycine	GlycineGlycine hydrochlorideN-Glycyl-L-leucine
(S)-2-Pyrrolidinecarboxylic acidL-Proline	L-Proline	L-Proline
(S)-2-Amino-3-hydroxypropanoic acidL-Serine	L-Serine	L-Serine
(S)-alpha-Amino-4-hydroxybenzenepropanoic acidL-Tyrosine	L-Tyrosine	L-TyrosineL-Tyrosine ethyl esterN-Acetyl-L-tyrosine



N/A	Ilex guayusallex paraguariensis	Leaf		
N/A	Paullinia cupana	Seed		
N/A	Theobroma cacao	Seed		

Proper name(s)	Common name(s)	Source information
As per the current NNHPD Multi-Vitamin/Mineral Supplement monograph		

	Common name(s)	Source information		
	Source material(s)	Part(s)	Preparation(s)	
ne-4-(Aminobutyl)guanidine	Agmatine	Agmatine sulfate	N/A	N/A
Beta-Dimethylaminoethyl-Dimethyl-N,N-Dimethyl-2-hydroxyethylamine	Decanol bitartrate	Decanol bitartrate	N/A	N/A
	AcerolaBarbados cherry treeEscobillo	N/A	Malpighia glabra	Fruit
	Black pepperPepper - blackPepper - whiteWhite pepper	N/A	Piper nigrum	Fruit
ioxol-5-yl)-1-oxo-2,4-piperidine	Piperidine	N/A	Piper nigrum	Fruit
thylammonium2-Hydroxy-N,N-trimethylethanaminiumCholine	CholineCholine alfoscerateCholine bitartrateCholine chlorideCholine citrateCholine N/A	N/A	N/A	N/A
	CayenneCayenne pepperChili pepperPaprikaRed pepper	N/A	Capsicum annuum	Fruit
	Lycopene	N/A	Solanum lycopersicum	Fruit f
	N/A	N/A		
acid(S)-alpha,delta-Dominicvaleric acid	L-OrnithineL-Ornithine hydrochlorideL-Ornithine N/A	N/A	L-aspartateOrnicetil	N/A
acid	Taurine	L-Arginine taurinateTaurineTaurine ethyl esterN/A	N/A	N/A

Medicinal Ingredients	Doses - Potency constituents		
protein	Isoflavones		
imum/day	Maximum/day	Maximum/day	
total amount of protein from Group 1 + amount of protein from Groups 2a and 2b	2.6 g of protein	35 g of protein	30 mg of Aglycone Isoflavone Equivalent

Medicinal Ingredients	Doses	
Minimum/day	Maximum/day1	
L-Histidine	49 mg	220 mg
L-Isoleucine	66.5 mg	3.5 g
L-Leucine	147 mg	7 g
L-Lysine	133 mg	3 g
L-Methionine	66.5 mg	1 g
L-Phenylalanine	115.5 mg	339 mg
L-Threonine	70 mg	301 mg



L-Tryptophan	17.5 mg	220 mg
L-Valine	84 mg	3.5 g

Medicinal Ingredients	Doses		
Minimum/day	Maximum/day1	Maximum/single dose	
L-Alanine	181.5 mg	363 mg	N/A
L-Arginine	208.5 mg	21 g	8 g
L-Asparagine	4.6 mg	93.5 mg	N/A
L-Aspartic acid	325 mg	1 g	N/A
beta-Alanine	240 mg	6.4 g	3.2 g
L-Citrulline	150 mg	6 g	3 g
L-Cysteine	50 mg	1 g	N/A
L-Glutamic acid	750 mg	1.5 g	N/A
L-Glutamine	342.5 mg	9 g	N/A
Glycine	160 mg	1.8 g	N/A
L-Proline	259.5 mg	519 mg	N/A
L-Serine	175.5 mg	351 mg	N/A
L-Tyrosine	139 mg	3.6 g	N/A

Medicinal Ingredients	Doses		
Minimum/day	Maximum/day	Maximum/single dose	
Combined dose for all ingredients from Group C in the product	635 g	180 g	45 g

	Uses or purposes	Methods of preparation	Doses	
	Maximum/day	Maximum/single dose		
tyrate	Enhances muscle strength in previously untrained individuals in combination with intense resistance training exercise	N/A		6 g
	Muscle recovery, Muscle tissue repair, Workout support/supplement	N/A	1 g	4 g
out support	20 g/supplement combined with Physical performance/Fatigue			
	3 g			
	Used in Herbal Medicine to help improve physical performance, heart, and circulation	Decoction, Fluid extract, Decoction, Infusion	10 g of dried root	10 g of dried root
	Used in Herbal Medicine to help enhance physical performance, heart, and circulation	Decoction, Fluid extract, Decoction, Infusion	10 g of dried root	10 g of dried root
	200 mg of extract standardized to 4-7% of total ginsenosides, Not to exceed 9 g of dried root/rootlets	Decoction, Fluid extract, Decoction, Infusion	10 g of dried root	10 g of dried root

	Loading Phase	Maintenance Phase			
Min/day	Max/day	Max/single dose	Min/day	Max/day	
Option 1	15 g	20 g	5 g	2 g	5 g

