IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

MASON DABISH and FRANK MUIR, individually and on behalf of all others similarly situated, Plaintiffs, v. 4 DIMENSION NUTRITION, INC., and GENERAL NUTRITION CORPORATION, Defendants.	)	No. 14-cv-8781 **JURY TRIAL DEMANDED**

CLASS ACTION COMPLAINT

Plaintiffs Mason Dabish and Frank Muir bring this Class Action Complaint against Defendants 4 Dimension Nutrition, Inc. ("4DN") and General Nutrition Corporation ("GNC") (collectively, "Defendants"), individually and on behalf of all others similarly situated, and complains and alleges upon personal knowledge as to themselves and their own acts and experiences and, as to all other matters, upon information and belief, including investigation conducted by their attorneys.

I. NATURE OF THE ACTION

1. This is a civil class action brought individually by Plaintiffs and on behalf of all persons in the below-defined proposed putative Classes ("Class Members") who purchased the dietary supplement 4 Dimension Nutrition Whey Phase (the "Product") from Defendants.

2. The whey protein industry is a growing and extremely competitive business environment: "during the forecast period, [the market for] protein products is expected to grow by 62% to reach US$7.8 billion in 2018."[1]

3. However, the price of wholesale whey protein keeps increasing and is usually purchased for roughly $15-$18/kilo, making the profit margins on whey protein powder products very low.

4. 4DN designed, manufactured, warranted, advertised and sold the Product throughout the United States, including in the States of California and Illinois.

5. GNC advertised, marketed, distributed and sold the Product throughout the United States, including in the States of California and Illinois.

6. In an effort to reduce protein manufacturing costs, 4DN adds cheaper free form amino acids and non-protein ingredients to increase the nitrogen content of the Product's protein powder. Nitrogen is the "tag" used by a common protein content test to determine the amount of protein in a product; but this is neither a direct measure of the actual protein content in a product nor a measure of the type of nitrogen containing compounds in a product.

7. This act is commonly referred to as "protein-spiking", "nitrogen-spiking" or "amino-spiking", and was evidenced recently in the 2007 pet food incident, which lead to domestic recalls of these products, and the 2008 Chinese milk powder scandal, when melamine, a nitrogen-rich chemical, was added to raw materials to fake high protein contents.

8. As a result of Defendants' practices, consumers – including Plaintiffs and the Class Members defined below – receive a product that contains less whey protein than Defendants represented.

[1] *See* http://www.euromonitor.com/sports-nutrition-in-the-us/report (last visited October 30, 2014).

9. This practice has been condemned by the American Herbal Products Association (AHPA), an organization of dietary supplement manufacturers, which has issued a standard for manufacturers for measuring the true protein content of their products, which:

a. Defines protein as "a chain of amino acids connected by peptide bonds" for labeling purposes;

b. The use of calculations to include only proteins that are "chains of amino acids connected by peptide bonds; and

c. To exclude any "non-protein nitrogen-containing substances" when counting total protein content.[2]

10. GNC has been a member of AHPA since 2003.

11. GNC, one of the largest distributors in the United States of whey protein products, has publicly criticized this conduct, claiming it to be misleading to consumers. According to GNC, consumers cannot be sure that they are getting 100 percent protein in their products since companies don't always show how they figure total grams of protein per serving.[3]

12. Despite the knowledge that "protein-spiking" is misleading to consumers, Defendants continue to advertise, distribute, label, manufacture, market, and sell the Product in a misleading and deceptive manner.

II. JURISDICTION AND VENUE

13. This Court has original jurisdiction pursuant to 28 U.S.C. § 1332(d)(2). In the aggregate, Plaintiffs' claims and the claims of the other members of the Class exceed $5,000,000 exclusive of interest and costs, and there are numerous class members who are citizens of States other than Defendants' States of citizenship, as detailed below.

[2] www.ahpa.org/Default.aspx?tabid=441 (last visited October 30, 2014).
[3] www.gnclivewell.com/realprotein (last visited October 30, 2014).

14. The Product is sold through numerous different online and brick/mortar retailers, including GNC, Vitacost.com and Bodybuilding.com. There are likely tens of thousands of class members composing the proposed classes with tens of millions of dollars spent on the Product due to the far reaching distribution channels and high consumer demand for whey protein products.

15. This Court has personal jurisdiction over Defendants because both 4DN and GNC conduct substantial business in the State of Illinois, such that Defendants have significant continuous and pervasive contacts with the State of Illinois.

16. Venue is proper in this District pursuant to 28 U.S.C. §§ 1301(a)(2), 1391(b)(2), and 1391(c)(2) as: a substantial part of the events and/or omissions giving rise to the claims emanated from activities within this District, and Defendants conduct substantial business in this District.

III. PARTIES

Plaintiffs

17. During the Class period, Plaintiff Mason Dabish and the other members of the below-defined Classes purchased the Product 4 Dimension Nutrition Whey Phase through Vitacost.com, Defendant GNC's brick and mortar retail stores and through its website www.gnc.com and numerous other brick and mortar and online retail stores.

18. Plaintiff Dabish and Class Members suffered an injury in fact caused by the false, fraudulent, unfair, deceptive and misleading practices set forth in this Complaint. Mason Dabish is a resident of the City of San Diego, State of California, and the events set forth in the Complaint took place therein, when, on or about September 2014, Dabish purchased the Product for his own use and not for resale from the online dietary supplement retailer vitacost.com.

19. During the Class period, Frank Muir and the other members of the below-defined Classes purchased the Product 4 Dimension Nutrition Whey Phase through Defendant GNC's brick and mortar retail stores and through its website www.gnc.com and numerous other brick and mortar and online retail stores.

20. Plaintiff Muir and Class Members suffered an injury in fact caused by the false, fraudulent, unfair, deceptive and misleading practices set forth in this Complaint. Muir is a resident of the City of Chicago, State of Illinois, and the events set forth in the Complaint took place therein, when, on or about August 2014, Muir purchased the Product for his own use and not for resale from Defendant GNC's retail store located in Lake Zurich, Illinois.

Defendants

21. 4 Dimension Nutrition, Inc. is licensed in the State of Connecticut, with a principal place of business address at 56 Arbor Street, Suite 304-B, Hartford, Connecticut 06106.

22. General Nutrition Corporation is licensed in the State of Pennsylvania, with a principal place of business address at 300 6th Ave., Pittsburgh, Pennsylvania 15222. GNC is the largest global specialty retailer of nutritional products, including vitamin, mineral, herbal and other specialty supplements and sports nutrition, diet and energy products. GNC has more than 4,800 retail locations throughout the United States (including more than 1,000 franchise and 1,200 Rite Aid store-within-a-store locations).

IV. FACTUAL BACKGROUND

The Differences Between Whey Protein & Free Form Amino Acids

23. Whey is a complete protein source, which means it contains all the essential amino acids your body needs to build protein-based compounds such as muscle tissue, skin, fingernails, hair and enzymes. Daily protein need depends on your size, gender and activity

levels, although it likely amounts to somewhere between 46 grams and 56 grams. For elite athletes, daily protein requirements are well over 100 grams, which is often difficult to get just from eating food. Of course, persons may need to supplement their protein intake for reasons of ill-health as well.

24. Whey protein powder is especially rich in branched-chain amino acids – leucine, isoleucine and valine – which are metabolized directly within your muscles as opposed to being processed in your liver first.

25. The 2005 dietary reference intake (DRI) guidance from the National Academy of Sciences clearly defines protein as macromolecules with links of amino acids, and does not mention free-form amino acids or creatine. Although amino acids are the building blocks of protein, they do not have the same beneficial effects of whole protein when they are free-form, and not part of an actual protein. Part of the reason for this has to do with protein digestion and absorption.

26. There have been several studies that have shown that protein is absorbed more effectively than free-form amino acids.[4]

27. Accordingly, at least one study was conducted to determine whether the effects of whey protein ingestion on muscle protein accrual are due solely to its constituent essential amino acid content. The study was a comparison of three trial groups. The first provided intact whey protein (whey protein powder). The other two trials provided either the individual essential amino acids (i.e. free-form) or the individual non-essential amino acids found in whey. The

[4] Di Pasquale MG. AMINO ACIDS AND PROTEINS FOR THE ATHLETE: THE ANABOLIC EDGE, SECOND EDITION. Boca Raton, FL: CRC Press; 2008:190.

researchers determined that whey protein ingestion improves skeletal muscle protein accrual through mechanisms that are beyond those attributed to its essential amino acid content.[5]

28. Yet another study found that "the lack of recovery after immobilization-induced atrophy during ageing is due to an 'anabolic resistance' of protein synthesis to amino acids during rehabilitation." The study's results "highlight a novel approach to induce muscle mass recovery following atrophy in the elderly by giving soluble milk protein or high protein diets."[6]

29. Thus, one review study the authors concluded that, "the bound form of an EAA [essential amino acid] may be more efficiently utilized than when delivered in its free-form."[7]

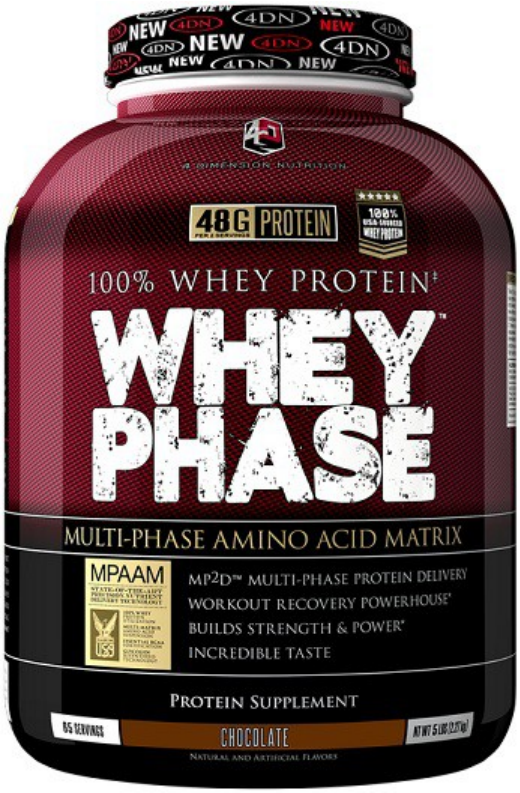
Defendants' Misleading Labeling of 4 Dimension Nutrition Whey Phase

30. Defendant features the name of the ingredient sought by millions of American consumers, "whey protein", by predominantly featuring it in the name of the Product, "4 Dimension Nutrition Whey Phase." The product label states plainly "100% Whey Protein" on the front, above "48 grams of protein per 2 servings" with the claim on the back of the label, under the supplement facts, that there are 24 grams of protein per serving:

[5] Katsanos C, *et al*. Whey protein ingestion in elderly results in greater muscle protein accrual than ingestion of its constituent essential amino acid content. Nutr. Res. Oct. 2008; 28(10):651-658.

[6] Magne H, *et al*. Contrarily to whey and high protein diets, dietary free leucine supplementation cannot reverse the lack of recovery of muscle mass after prolonged immobilization during ageing. J. Physiol. Apr 15, 2012; 590(Pt 8): 2035-2049.

[7] Terada T, Inui K. Peptide transporters: structure, function, regulation and application for drug delivery. Curr Drug Metab. 2004;5:85-94.



Supplement Facts

Serving size: 35 g
Servings per container: 130 servings

Amount per serving		% Daily Value
Calories	150	
Calories from fat	15	
Total fat	2 g	3%
Saturated fat	0.5 g	3%
Trans fat	0 g	†
Cholesterol	40 mg	13%
Total carbohydrates	8 g	3%
Dietary fiber	1 g	4%
Sugars	2 g	†
Protein	24 g	48%
Calcium	150 mg	15%
Sodium	120 mg	5%
Potassium	200 mg	6%

PHASE 1: MPAAM™ (Multi-Phase™ Amino Acid Matrix)
Cross-Flow Micro-Filtration Technology: [Whey Protein Concentrate (80% Yield), Whey Protein Isolate (90% Yield), WPI97 Hydrolyzed Whey (97% Yield)], Creatine Monohydrate, BCAAs (L-Leucine, L-Valine, L-Isoleucine), L-Glutamine

PHASE 2: Pro-Energy Carb Matrix™
Maltodextrin, Guar Gum, Xanthan, Cellulose Gum, Lactase

PHASE 3: Functional Lean Lipid Matrix™
Sunflower Oil, CLA (Conjugated Linoleic Acid), Flax Seed Oil Powder

* Percent Daily Values are based on a 2000 calorie diet.
† Daily value not established.

Other Ingredients: Mono and Di Glycerides, Natural and Artificial Flavors, Acesulfame Potassium and Sucralose.

31. The false and misleading label claim of "100% Whey Protein" is also contained on the back Product label contained within the description of the Product.

32. However, Defendants' claimed total protein count of 24 grams of protein per serving, in 4 Dimension Nutrition Whey Phase, is not "100% Whey Protein" but also includes, for the purposes of "protein-spiking": several free form amino acids, including L-Leucine, L-Valine, L-Isoleucine, L-Glutamine; and the non-amino acid compound Creatine Monohydrate[8].

33. Once these "protein spiking" agents are removed from the formula of analysis, and the "bound" amino acid count is determined, the true content of whey protein in the Product can be determined.

34. After scientific testing of the Product, the actual total content per serving of whey protein is actually around 15.579 grams (as calculated from the total bonded amino acids) as opposed to 24 grams of protein claims by Defendants for their "Whey Protein" product. *See* Exhibit A.

35. The FDCA actually speaks to the misleading nature of this sort of labeling of a product under 21 C.F.R. § 101.18(b), which states:

> The labeling of a food which contains two or more ingredients may be misleading by reason (among other reasons) of the designation of such food in such labeling by a name which includes or suggests the name of one or more but not all such ingredients, even though the names of all such ingredients are stated elsewhere in the labeling.

36. In violation of 21 C.F.R. § 101.18(b), Defendants mislead consumers by repeatedly referencing whey protein, including in the name of the Product, but never disclaiming the limited amount of whey protein that the Product actually delivers or making clear that the Product's protein content is only fractionally whey protein.

[8] Defendants falsely and misleadingly place Creatine Monohydrate under their "Multi-Phase Amino Acid Matrix". However, Creatine Monohydrate is not in fact an amino acid.

37. A reasonable consumer, looking at the name of the Product, and reading the "Supplement Facts", is misled into thinking that the 24 grams of protein per serving claimed by Defendants for the Whey Protein Product are derived exclusively from the Whey Protein.

38. Moreover, Defendants make a further deceptive claim on the actual label of the Product: "100% Whey Protein".

39. Defendant 4DN goes even further and uses the false and misleading claims that the products contain "100% USA Sourced Premium Protein" and provide "48 Grams of Anabolic Whey Protein Per Serving":

40. This false and misleading label claim, the misleading marketing material, along with the Product's name, "4 Dimension Nutrition", taken together, mislead reasonable consumers that the protein content of the Product was derived solely from whey protein.

41. Nowhere on the label does it state, or even imply, that the protein content contains any, let alone substantial amounts of free form and non-protein amino acids.

Defendant GNC's Liability

42. Defendant GNC incorporates all of the Product's label claims and product images described herein on their website gnc.com, going so far as to include the claim "100% Whey Protein" in the URL of the product page.[9]

43. Defendant GNC is a leading retailer in the United States of dietary supplements and employs several attorneys and regulatory personnel.

44. Under information and belief, these employees of GNC review all labels and marketing materials of vendors, including Defendant 4DN, and have the ability to change false and misleading marketing material, request different product formulations, and ultimately reject products from being sold in their brick/mortar retail stores and online store.

45. Under information and belief, GNC has the ability to obtain certificates of analysis for review prior to approving a product for sale in their stores and website.

46. Not only has GNC been a member of AHPA, the organization that issued guidance to the industry on the misleading conduct contained herein, they also have the knowledge of "protein spiking" and actually reference the practice and another class action lawsuit, while promoting their own protein product line[10].

[9] http://www.gnc.com/4-Dimension-100-Whey-Protein-Whey-Phase-Chocolate/product.jsp?productId=20282876 (last visited October 30, 2014).

[10] *See* www.gnclivewell.com/realprotein and http://gnclivewell.com/blog/2014/07/31/protein-spiking-how-does-it-affect-you/ (last visited October 30, 2014).

47. Plaintiffs and Class Members were in fact misled by Defendants' representations regarding the true nature of the protein content and value.

48. The difference between the Product promised and the Product sold is significant. The amount of actual protein provided, and the measure of protein per serving, has real impacts on the benefits provided to consumers by the Product, and the actual value of the Product itself.

49. Persons requiring a certain amount of protein supplementation, whether as part of a fitness regimen or for real health needs, are left to ingest less protein than Defendants state will be provided.

50. Defendants' false and misleading claims contained herein are in violation of 21 C.F.R. § 101.18(b), making the Product misbranded.

51. Defendants' deceptive statements violate 21 U.S.C. § 343(a)(1), which deems food (including nutritional supplements) misbranded when the label contains a statement that is "false or misleading in any particular".

52. California prohibits the misbranding of food in a way which parallels the FDCA through the "Sherman Law", Health & Saf. Code § 109875 *et seq*. The Sherman Law provides that food is misbranded "if its labeling is false or misleading in any particular." *Id.*

53. The Sherman Law explicitly incorporates by reference "[a]ll food labeling regulations and any amendments to those regulations adopted pursuant to the FDCA," as the food labeling regulations of California Cal. Health & Saf. Code, § 110100, subd. (a).

54. Illinois has expressly adopted the federal food labeling requirements as its own and indicated that "The Director is authorized to make the regulations promulgated under this Act conform, in so far as practicable, with those promulgated under the Federal Act."

Additionally, "[a] federal regulation automatically adopted pursuant to this Act takes effect in this State on the date it becomes effective as a Federal regulation." 410 ILCS 620/21.

55. Further, as explained above, Defendants' claims are misleading to consumers in violation of 21 U.S.C. § 343, which states, "A food shall be deemed to be misbranded—False or misleading label [i]f its labeling is false or misleading in any particular."

56. The ILCS incorporates the exact language of the FDCA in 410 ILCS 620/11 by stating, "A food is misbranded- (a) If its labeling is false or misleading in any particular."

57. Also, the ICFA provides protection for consumers when purchasing products, including Defendants' Product, by stating, "Unfair methods of competition and unfair or deceptive acts or practices, including but not limited to the use or employment of any deception fraud, false pretense, false promise, misrepresentation or the concealment, suppression or omission of any material fact, with intent that others rely upon the concealment, suppression or omission of such material fact…" 815 ILCS 505/2.

58. The introduction of misbranded food into interstate commerce is prohibited under the FDCA and all state parallel statutes cited in this Class Action Complaint.

59. Plaintiffs and Class Members would have purchased another whey protein product, if any at all, or would have only paid for the whey protein actually delivered with the Product, if they would have not been deceived by the misleading labeling of the Product by Defendants.

V. CLASS ACTION ALLEGATIONS

60. Plaintiffs bring this action individually and as representatives of all those similarly situated pursuant to Rule 23 F.R.C.P. on behalf of the below-defined Classes:

> **National Class:** All persons in the United States that purchased the Product at any time during the four years before the date of filing of this Complaint to the present.
>
> **Consumer Fraud Multi-State Class:** All persons in the States of California, Florida, Illinois, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, and Washington that purchased the Product at any time during the four years before the date of filing of this Complaint to the present.[11]
>
> **California Subclass:** All persons in the State of California that purchased the Product at any time during the four years before the date of filing of this Complaint to the present.
>
> **Illinois Subclass:** All persons in the State of Illinois that purchased the Product at any time during the four years before the date of filing of this Complaint to the present.

Excluded from the Classes are Defendants and its affiliates, parents, subsidiaries, employees, officers, agents, and directors. Also excluded are any judicial officers presiding over this matter and the members of their immediate families and judicial staff.

61. Certification of Plaintiffs' claims for class-wide treatment is appropriate because Plaintiffs can prove the elements of their claims on a class-wide basis using the same evidence as would be used to prove those elements in individual actions alleging the same claims.

62. **Numerosity – Federal Rule of Civil Procedure 23(a)(1).** The members of the Classes are so numerous that their individual joinder herein is impracticable. On information and belief, Class members number in the thousands to millions. The precise number of Class

[11] The States in the Consumer Fraud Multi-State Class are limited to those States with similar consumer fraud laws under the facts of this case: California (Cal. Bus. & Prof. Code §17200, *et seq.*); Florida (Fla. Stat. §501.201, *et seq.*); Illinois (815 Ill. Comp. Stat. 502/1, *et seq.*); (Massachusetts (Mass. Gen. Laws Ch. 93A, *et seq.*); Michigan (Mich. Comp. Laws §445.901, *et seq.*); Minnesota (Minn. Stat. §325F.67, *et seq.*); Missouri (Mo. Rev. Stat. 010, *et seq.*); New Jersey (N.J. Stat. §56:8-1, *et seq.*); New York (N.Y. Gen. Bus. Law §349, *et seq.*); and Washington (Wash. Rev. Code §19.86.010, *et seq.*).

members and their addresses are presently unknown to Plaintiffs, but may be ascertained from Defendants' books and records. Class members may be notified of the pendency of this action by mail, email, Internet postings, and/or publication.

63. **Commonality and Predominance – Federal Rule of Civil Procedure 23(a)(2) and 23(b)(3).** Common questions of law and fact exist as to all Class members and predominate over questions affecting only individual Class members. Such common questions of law or fact include:

a. The true nature of the protein content in the Product;

b. Whether the marketing, advertising, packaging, labeling, and other promotional materials for the Product are deceptive;

c. Whether Defendants' actions violate the State consumer fraud statutes invoked below;

d. Whether Defendants' actions violate California's law against false advertising, Business and Professions Code §17500, *et seq*.;

e. Whether Defendants' actions violate California's Consumer Legal Protection Act, Civil Code §1750, *et seq*.;

f. Whether Defendants were Unjustly Enriched at the expense of the Plaintiffs and Class Members; and

g. Whether Defendants violated an Express Warranty to Plaintiffs and Class Members.

64. Defendants engaged in a common course of conduct giving rise to the legal rights sought to be enforced by Plaintiff, on behalf of himself and the other Class members. Similar or identical statutory and common law violations, business practices, and injuries are involved.

Individual questions, if any, pale by comparison, in both quality and quantity, to the numerous common questions that dominate this action.

65. **Typicality – Federal Rule of Civil Procedure 23(a)(3).** Plaintiffs' claims are typical of the claims of the other members of the Classes because, among other things, all Class members were comparably injured through Defendants' uniform misconduct described above. Further, there are no defenses available to Defendants that are unique to Plaintiffs.

66. **Adequacy of Representation – Federal Rule of Civil Procedure 23(a)(4).** Plaintiffs are adequate Class representatives because their interests do not conflict with the interests of the other Class members they seek to represent, they have retained counsel competent and experienced in complex class action litigation, and they will prosecute this action vigorously. The Classes' interests will be fairly and adequately protected by Plaintiffs and their counsel.

67. **Insufficiency of Separate Actions – Federal Rule of Civil Procedure 23(b)(1).** Absent a representative class action, members of the Classes would continue to suffer the harm described herein, for which they would have no remedy. Even if separate actions could be brought by individual consumers, the resulting multiplicity of lawsuits would cause undue hardship and expense for both the Court and the litigants, as well as create a risk of inconsistent rulings and adjudications that might be dispositive of the interests of similarly situated purchasers, substantially impeding their ability to protect their interests, while establishing incompatible standards of conduct for Defendants. The proposed Classes thus satisfy the requirements of Fed. R. Civ. P. 23(b)(1).

68. **Declaratory and Injunctive Relief – Federal Rule of Civil Procedure 23(b)(2).** Defendants have acted or refused to act on grounds generally applicable to Plaintiffs and the

other members of the Classes, thereby making appropriate final injunctive relief and declaratory relief, as described below, with respect to the members of the Classes as a whole.

69. **Superiority – Federal Rule of Civil Procedure 23(b)(3).** A class action is superior to any other available means for the fair and efficient adjudication of this controversy, and no unusual difficulties are likely to be encountered in the management of this class action. The damages or other financial detriment suffered by Plaintiffs and the other members of the Classes are relatively small compared to the burden and expense that would be required to individually litigate their claims against Defendants, so it would be impracticable for Class members to individually seek redress for Defendant's wrongful conduct. Even if Class members could afford individual litigation, the court system could not. Individualized litigation creates a potential for inconsistent or contradictory judgments, and increases the delay and expense to all parties and the court system. By contrast, the class action device presents far fewer management difficulties, and provides the benefits of single adjudication, economy of scale, and comprehensive supervision by a single court.

VI. CHOICE OF LAW

The Substantive Law of Illinois Applies to the Claims of the National Class

70. Illinois' substantive laws apply to the claims asserted by the proposed National Class, as set forth below, because Plaintiffs properly brings this action in this District. A United States District Court sitting in diversity presumptively applies the substantive law of the state in which it sits. *Land v. Yamaha Motor Corp., U.S.A.*, 272 F. 3d 514, 516 (7th Cir. 2001).

71. The Court may constitutionally apply Illinois' substantive laws to Plaintiffs' claims and the claims of the National Class under the Due Process Clause of the Fourteenth Amendment, § 1, and the Full Faith and Credit Clause, Article IV, § 1, of the United States

Constitution. The claims asserted by Plaintiffs contain significant contact, or a significant aggregation of contacts, to ensure an adequate state interest and supports the choice of Illinois state law as just and reasonable.

72. Defendants conduct substantial business in Illinois, providing Illinois with an interest in regulating Defendants' conduct under Illinois laws. Defendants' decision to regularly conduct business in Illinois and avail themselves of Illinois' laws render the application of Illinois law to the claims at hand constitutionally permissible.

73. The injury to Plaintiffs and to a significant number of members of the proposed Class by virtue of the conduct alleged, occurred in Illinois. Plaintiff Muir resides in Illinois and purchased Defendants' Product in Illinois. A substantial number of the proposed Nationwide Class reside in Illinois and purchased Defendants' Products in Illinois.

74. The application of Illinois law to the members of the proposed National Class is also appropriate under Illinois' choice-of-law rules, because Illinois has significant contacts with the claims of the Plaintiffs and each of the members of the proposed National Class.

VII. CLAIMS ALLEGED

COUNT I
Violation of the Consumer Legal Remedies Act
Cal. Civ. Code §1750, *et. seq.*
(On Behalf of the California Subclass Members)

75. Plaintiff Dabish incorporates paragraphs 1-69 as if fully set forth herein.

76. Plaintiff Dabish and each member of the California Subclass is a "Consumer" as that term is defined by Cal. Civ. Code § 1761(d).

77. The Product is a "Good" as that term is defined by Cal. Civ. Code § 1761(a).

78. Defendants are a "Person" as defined by Cal. Civ. Code § 1761(c).

79. The transaction(s) involved here are "Transaction(s)" as defined by Cal. Civ. Code § 1761(e).

80. Plaintiff Dabish and the members of the California Subclass are Consumers who purchased the Product for personal use within the applicable statute of limitations period.

81. Plaintiff Dabish and the members of the California Subclass have standing to pursue this cause of action because they have suffered injury-in-fact and have lost money or property as a result of Defendants' actions as set forth here.

82. Plaintiff Dabish and the members of the California Subclass purchased the Product in reliance on Defendants' labeling and marketing claims.

83. Defendants have used deceptive representations with respect to the Product in violation of Cal. Civ. Code §1770(a)(4).

84. Defendants have misrepresented the sponsorship, approval, characteristics, or ingredients of the Product in violation of Cal. Civ. Code §1770(a)(5).

85. Defendants have misrepresented the standard, quality, or grade of the Product in violation of Cal. Civ. Code §1770(a)(7).

86. Defendants knew or should have known that their representations of fact are material and likely to mislead consumers.

87. Defendants' practices, acts, and course of conduct in marketing and selling the Product are likely to mislead a reasonable consumer acting reasonably under the circumstances to his or her detriment. Plaintiff Dabish and the members of the California Subclass would not have purchased the Product had they known the true amount of whey protein in the Product.

88. Plaintiff Dabish and the members of the California Subclass have been directly and proximately damaged by Defendants' actions.

89. In conjunction with filing this Complaint, Plaintiffs' Counsel mailed to Defendants, by certified mail, return receipt requested, the written notice required by Civil Code §1782(a). Should Defendants fail to respond within thirty days, Plaintiffs will amend to seek damages under the Consumer Legal Remedies Act.

90. Defendants have engaged in, and continue to engage in, business practices in violation of the Consumer Legal Remedies Act, Civ. Code §1750, et seq. by continuing to make false and misleading representations on their labeling of the Product.

91. These business practices are misleading and/or likely to mislead Consumers and should be enjoined.

COUNT II
Violation of False Advertising Law
Cal. Bus. & Prof. Code § 17500, *et seq.*
(On Behalf of the California Subclass Members)

92. Plaintiff Dabish incorporates paragraphs 1-69 as if fully set forth herein.

93. Plaintiff Dabish and the members of the California Subclass have standing to pursue a cause of action for false advertising under Bus. & Prof. Code §17500, et seq. because Plaintiff Dabish and the members of the California Subclass have suffered an injury-in-fact and lost money as a result of Defendants' actions as set forth herein.

94. Defendants advertised, marketed, and otherwise disseminated misleading information to the public through advertising mediums including the Internet statements regarding the Product.

95. Defendants continue to disseminate such statements.

96. Defendants' statements are misleading.

97. Defendants know that these statements were misleading, or could have discovered their misleading nature with the exercise of reasonable care.

98. Defendants' misleading statements were part of a scheme or plan to sell the Product to the public the true nature of the protein content as calculated and published in their Supplements Facts.

99. Plaintiff Dabish and the members of the California Subclass relied on Defendants' marketing, labeling, and other product literature.

100. Defendants' actions violate Cal. Bus. & Prof. Code § 17500, et seq.

101. As a direct and proximate result of Defendants' actions, as set forth herein, Defendants have received ill-gotten gains and/or profits, including but not limited to money from Plaintiff Dabish and the members of the California Subclass who paid for the Product. Therefore, Defendants have been unjustly enriched.

102. Plaintiff Dabish and the members of the California Subclass seek injunctive relief, restitution, and disgorgement of Defendants' ill-gotten gains as provided for by Cal. Bus. & Prof. Code §17535.

103. Plaintiff Dabish and the members of the California Subclass seek injunctive relief to compel Defendants from continuing to engage in these wrongful practices in the future. No other adequate remedy at law exists. If an injunction is not ordered, Plaintiff and Class members will suffer irreparable harm and/or injury.

COUNT III
Violation of State Consumer Fraud Acts
(On Behalf of the Multi-State Class)

104. Plaintiffs incorporate paragraphs 1-69 as if fully set forth herein.

105. The Consumer Fraud Acts of the States in the Consumer Fraud Multi-State Class[12] prohibit the use of unfair or deceptive business practices in the conduct of trade or commerce.

106. Defendants intended that Plaintiffs and each of the other members of the Consumer Fraud Multi-State Class would rely upon their deceptive conduct, and a reasonable person would in fact be misled by this deceptive conduct.

107. As a result of the Defendants' use or employment of unfair or deceptive acts or business practices, Plaintiffs and each of the other members of the Consumer Fraud Multi-State Class have sustained damages in an amount to be proven at trial.

108. In addition, Defendants' conduct showed malice, motive, and the reckless disregard of the truth such that an award of punitive damages is appropriate.

COUNT IV
Violation of the Unfair Competition Act
Cal. Bus. & Prof. Code § 17200, *et seq.*
(In the alternative to Count III and on behalf of the California Subclass)

109. Plaintiff Dabish incorporates paragraphs 1-69 as if fully set forth herein.

110. Plaintiff Dabish and the California Subclass have standing to pursue a cause of action for false advertising under Bus & Prof. Code §17200, et seq. because Plaintiff and members of the California Subclass have suffered an injury-in-fact and lost money as a result of Defendants' actions as set forth herein.

111. Defendants' actions as described herein constitute unfair competition within the meaning of Bus. & Prof. Code §17200, in that Defendants have engaged in unlawful, unfair, or

[12] California (Cal. Bus. & Prof. Code §17200, *et seq.*); Florida (Fla. Stat. §501.201, *et seq.*); Illinois (815 Ill. Comp. Stat. 502/1, *et seq.*); (Massachusetts (Mass. Gen. Laws Ch. 93A, *et seq.*); Michigan (Mich. Comp. Laws §445.901, *et seq.*); Minnesota (Minn. Stat. §325F.67, *et seq.*); Missouri (Mo. Rev. Stat. 010, *et seq.*); New Jersey (N.J. Stat. §56:8-1, *et seq.*); New York (N.Y. Gen. Bus. Law §349, *et seq.*); and Washington (Wash. Rev. Code §19.86.010, *et seq.*).

fraudulent business practices by violating California's Sherman Food Drug & Cosmetic Act and California's Consumer Legal Remedies Act.

112. Defendants' actions as described herein constitute unfair competition within the meaning of Bus. & Prof. Code §17200, on the additional grounds that Defendants have failed to properly label the Product in accordance with 21 C.F.R. 101, et seq.

113. Defendants' actions also constitute unfair competition within the meaning of Bus. & Prof. Code §17200, in that Defendant has made unfair, deceptive, untrue or misleading statements in advertising mediums, including the Internet, in violation of Bus. & Prof. Code §17500.

114. Defendants' actions have caused economic injury to Plaintiff Dabish and California Subclass members. Plaintiff and Class members would not have purchased the Product had they known the true nature of the whey protein content.

115. Pursuant to Bus. & Prof. Code §17203, Plaintiff Dabish and the California Subclass seek an injunction enjoining Defendants from continuing to market, advertise, and sell the Product without first complying with federal and state law and to prevent Defendants from continuing to engage in unfair competition or any other act prohibited by law.

116. Plaintiff Dabish and the California Subclass also seek an order requiring Defendants to make full restitution and disgorgement of their ill-gotten gains of all money wrongfully obtained from Plaintiff and Class members as permitted by Bus. & Prof. Code §17203.

COUNT V
Violation of Illinois Consumer Fraud Act
815 ILCS 505/1 *et seq.*
(In the alternative to Count III and on behalf of the Illinois Subclass)

117. Plaintiff Muir incorporates paragraphs 1-69 as if fully set forth herein.

118. The Illinois Consumer Fraud and Deceptive Business Practices Act ("ICFA"), 815 ILCS 505/1 *et seq.* ("ICFA") prohibits the use of unfair or deceptive business practices in the conduct of trade or commerce. The ICFA is to be liberally construed to effectuate its purpose.

119. Defendants intended that Plaintiff Muir and each of the other members of the Illinois Subclass would rely upon their deceptive conduct, and a reasonable person would in fact be misled by this deceptive conduct.

120. As a result of the Defendants' use or employment of unfair or deceptive acts or business practices, Plaintiff Muir and each of the other members of the Illinois Subclasses have sustained damages in an amount to be proven at trial.

121. In addition, Defendants' conduct showed malice, motive, and the reckless disregard of the truth such that an award of punitive damages is appropriate.

COUNT VI
Unjust Enrichment
(On Behalf of the National Class)

122. Plaintiffs incorporate paragraphs 1-74 as if fully set forth herein.

123. Plaintiffs and the other members of the National Class conferred benefits on Defendants by purchasing the Product.

124. Defendants have been unjustly enriched in retaining the revenues derived from Plaintiffs and the other members of the National Class' purchase of the Product. Retention of those monies under these circumstances is unjust and inequitable because Defendants' labeling of the Product was misleading to consumers, which caused injuries to Plaintiffs and the other members of the National Class because they would have not purchased the Product if the true facts would have been known.

125. Because Defendants' retention of the non-gratuitous benefits conferred on them by Plaintiffs and the other members of the National Class is unjust and inequitable, Defendants must pay restitution to Plaintiffs and the other members of the National Class for their unjust enrichment, as ordered by the Court.

COUNT VII
Breach of Express Warranty
(On Behalf of the National Class)

126. Plaintiffs incorporate paragraphs 1-74 as if fully set forth herein.

127. Plaintiffs, and each member of the National Class, formed a contract with Defendants at the time Plaintiffs and the other National Class members purchased the Product. The terms of the contract includes the promises and affirmations of fact made by Defendants on the Product's packaging and through marketing and advertising, as described above. This labeling, marketing and advertising constitute express warranties and became part of the basis of bargain, and are part of the standardized contract between Plaintiffs and the members of the National Class and Defendants.

128. Defendants purport through its advertising, labeling, marketing and packaging to create an express warranty that the Product contained "100% Whey Protein".

129. Plaintiffs and the National Class performed all conditions precedent to Defendants' liability under this contract when they purchased the Product.

130. Defendants breached express warranties about the Product and its qualities because Defendants' statement about the Product was false and the Product does not conform to Defendants' affirmations and promises described above.

131. Plaintiffs and each of the members of the National Class would not have purchased the Product had they known the true nature of the Product's ingredients and what the Product contained.

132. As a result of Defendants' breach of warranty, Plaintiffs and each of the members of the National Class have been damaged in the amount of the purchase price of the Product and any consequential damages resulting from the purchases.

VIII. DEMAND FOR JURY TRIAL

Plaintiff demands a trial by jury of all claims in this complaint so triable.

IX. REQUEST FOR RELIEF

WHEREFORE, Plaintiffs, individually and on behalf of the other members of the Classes proposed in this Complaint, respectfully request that the Court enter judgment as follows:

A. Declaring that this action is a proper class action, certifying the Class as requested herein, designating Plaintiffs as Class Representative and appointing the undersigned counsel as Class Counsel for the Classes;

B. Ordering Defendants to pay actual damages to Plaintiffs and the other members of the Classes;

C. Ordering Defendants to pay punitive damages, as allowable by law, to Plaintiffs and the other members of the Classes;

D. Ordering Defendants to pay statutory damages, as provided by the applicable state consumer protection statutes invoked above, to Plaintiffs and the other members of the Classes;

E. Ordering Defendants to pay attorneys' fees and litigation costs to Plaintiffs and the other members of the Classes;

F. Ordering Defendants to pay both pre- and post-judgment interest on any amounts awarded;

G. Leave to amend this Complaint to conform to the evidence presented at trial; and

H. Ordering such other and further relief as may be just and proper.

Dated: November 4, 2014

Respectfully submitted,

/s/ Joseph J. Siprut
Joseph J. Siprut
jsiprut@siprut.com
Gregory W. Jones
gjones@siprut.com
SIPRUT PC
17 N. State Street
Suite 1600
Chicago, Illinois 60602
312.236.0000
Fax: 312.878.1342
www.siprut.com

Nick Suciu III*
nicksuciu@bmslawyers.com
BARBAT, MANSOUR & SUCIU PLLC
434 West Alexandrine
Suite 101
Detroit, Michigan 48201
313.303.3472

Jonathan Shub*
jshub@seegerweiss.com
SEEGER WEISS, LLP
1515 Market Street
Phila, Pennsylvania 19102
215.564.1300

Counsel for Plaintiffs
And the Proposed Putative Classes

* *Pro Hac Vice* Application Forthcoming

4820-8793-9102, v. 1

Exhibit A

ChromaDex®
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Process Report

Customer:	Barbat, Mansour & Suciu PLLC	Report Number:	CDXA-PR-155-00
Address (City, State):	Detroit, MI	Project Number:	ORD68542
Purchase Order:	N/A	Date Received:	26-Sep-14
Date of Report:	23-Oct-14	Test Location:	Boulder, CO
Assay:	4 Dimension Nutrition Whey Phase		
Part Number:	PRJ-CONSOL-RPT; CDA-00100666-ATR; CDA-00100140-ARS; CDA-00100156-ATR		

Prepared By:	**Sylesh Venkataraman, Ph.D** Sr. Director, Laboratory	23-Oct-14 Date
Reviewed By:	**Aron Erickson** Director, Laboratory Operations	23-Oct-14 Date
Approved By:	Sarah Garthe Digitally signed by Sarah Garthe DN: cn=Sarah Garthe, o=ChromaDex Analytics, ou=Quality Assurance, email=SarahG@chromadex.com, c=US Date: 2014.10.23 16:58:18 -06'00' Quality Assurance	23-Oct-14 Date

Signed original on file at CDXA

SUMMARY

• *ABSTRACT*

One sample was received from Barbat, Mansour & Suciu PLLC for a multitude of analyses.

1) 4 Dimension Nutrition Whey Phase (lot# 14114); ChromaDex sample# CDXA-14-5942.

• *INTRODUCTION*

The sample from Barbat, Mansour & Suciu PLLC was analyzed for Free and Total amino acid content and Creatine content.

• *DISCUSSION*

A summary of the results are included below in Table 1. Table 2 lists the individual amino acids from the total and free amino acids analyses.

Table 1; Sample: CDXA-14-5942

Analysis	Units	Result
Total Amino acids	mg/srv (35g)	18799
Total Free Amino acids	mg/srv(35g)	3220
Total Bound Amino acids	mg/srv(35g)	15579
Creatine	mg/srv(35g)	3060

Table 2 –CDXA-14-5942

Analyte	Units	Total Amino Acids	Free Amino Acids	Bound Amino acids
Aspartic acid	mg/serving	1570	ND	1570
Glutamic acid	mg/serving	2740	ND	2740
Serine	mg/serving	816	ND	816
Histidine	mg/serving	392	ND	392
Glycine	mg/serving	3500	3220	280
Threonine	mg/serving	1050	ND	1050
Arginine	mg/serving	483	ND	483
Alanine	mg/serving	735	ND	735
Tyrosine	mg/serving	539	ND	539
Cystine	mg/serving	315	ND	315
Valine	mg/serving	879	ND	879
Methionine	mg/serving	347	ND	347
Phenylalanine	mg/serving	546	ND	546
Isoleucine	mg/serving	973	ND	973
Leucine	mg/serving	1590	ND	1590
Lysine	mg/serving	1340	ND	1340
Proline	mg/serving	984	ND	984
Asparagine	mg/serving		ND	0
Glutamine	mg/serving		ND	0
Tryptophan	mg/serving		ND	0
Hydroxyproline	mg/serving		ND	0
Total	mg/serving	18799	3220	15579
Serving Size = 35 g				

- ***REFERENCES***

1) CDXA-ATR-6695-00; Amino acids Base Panel of 21
2) CDXA-ATR-6688-00; Creatine by HPLC
3) Sub12; Report# 1091978-0; Total Amino acids by Profile by HPLC

REVISION HISTORY

Revision Number	Document/Changes
00	New report

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Analytical Test Report

Customer:	Barbat, Mansour & Suciu PLLC	Report Number:	CDXA-ATR-6688-00
Address (City, State):	Detroit, MI	Project Number:	ORD68542
Purchase Order:	Not Provided	Date Received:	26-Sep-14
Date of Report:	09-Oct-14	Test Location:	Boulder, CO

Assay: Creatine by HPLC

Part Number: CDA-00100156-ATR

Prepared By: **Richard Vigil** — Manager, Analytical Services — 09-Oct-14 (Date)

Reviewed By: **Devon Cruz** — Analyst I — 09-Oct-14 (Date)

Approved By: **Sarah Garthe** — Quality Assurance — 09-Oct-14 (Date)

Signed original on file at CDXA

SUMMARY

- ***SAMPLE(S)***

	Lot #	CDXA #
4 Dimension Nutrition Whey Phase	14114	CDXA-14-5942

- ***RESULTS***

Table 1 – Results CDXA-14-5942

Analyte	Units	Spec.	Result	Reporting Limit
Creatine	mg/serving	N/A	3060	--

Serving Size: 35g

ND – Not detected above reporting Limit

BRL – Below reporting limit (compound detected below RL)

ANALYTICAL METHOD

- ***STANDARD(S)*** *All standards supplied by ChromaDex, unless otherwise specified.*

	Part #
Creatine	Sigma-C0780

- ***LABORATORY SUPPLIES***

Analytical Balance
Ultrasonication Bath
Assorted and Volumetric glassware
Syringes and Syringe Filters
HPLC/GC glass vials and caps

- ***SOLVENTS AND REAGENTS***

Acetonitrile (ACN)
Tetrahydrofuran (THF)
Milli-Q Water
Formic Acid
Ammonium Formate

- ***SOLUTION PREPARATION***

Mobile Phase A (2mM Ammonium Formate, pH 4.0)

Solution was prepared by adding 125 mg of Ammonium Formate to ~900 mL of Milli Q Water in a 1000mL volumetric flask and mixing well. The pH was adjusted to 4.0 using formic acid. The solution was then diluted to volume with Milli-Q water, mixed well and transferred to a 1 L mobile phase container.

Mobile Phase B (5% 2mM Ammonium Formate, pH 4.0 in ACN)

Solution was prepared by adding 50 mL of 2mM Ammonium Formate, pH 4 to 950 mL of ACN in a 1000mL volumetric flask and mixing well.

Diluent (50:50 Water:THF)

Diluent was prepared by adding 250 mL of Milli-Q water and 250 mL of THF into a 500 mL volumetric flask and mixing well.

- ***STANDARD PREPARATION***

Stock Standard Solution

Approximately 6.5 mg of Creatine was weighed into a 25 mL volumetric flask. 25 mL of diluent was added and the solution sonicated for 15 minutes. The solution was allowed to re-equilibrate to room temperature and mixed well.

- ***SAMPLE PREPARATION***

Customer Sample(s) CDXA-14-5942

Sample was prepared by weighing approximately 125 mg of sample into a 25 mL volumetric flask. 25 mL of diluent was added and the flask sonicated for 15 minutes. The samples were filtered through a 0.45 µm PTFE filter into an HPLC vial for analysis.

- ***INSTRUMENT PARAMETERS***

Instrument	Agilent 1100 Series HPLC System
Detection	UV-Vis
Mobile Phase A	2mM Ammonium Formate, pH 4.0
Mobile Phase B	5% 2mM Ammonium Formate, pH 4.0 in ACN

Gradient Program

Time (min)	%A	%B
0.0	0	100
5.0	0	100
25.0	45	55
30.0	45	55
33.0	0	100
45	0	100

Column	Cogent Diamond Hydride, 150 x 3mm x 4.0
Flow Rate	1.0 mL/min
UV Detection	205 nm
Injection Volume	1 µL
Temperature	30 °C

DATA

- ***FIGURES***

Figure 1: Creatine Standard (UV Chromatogram)

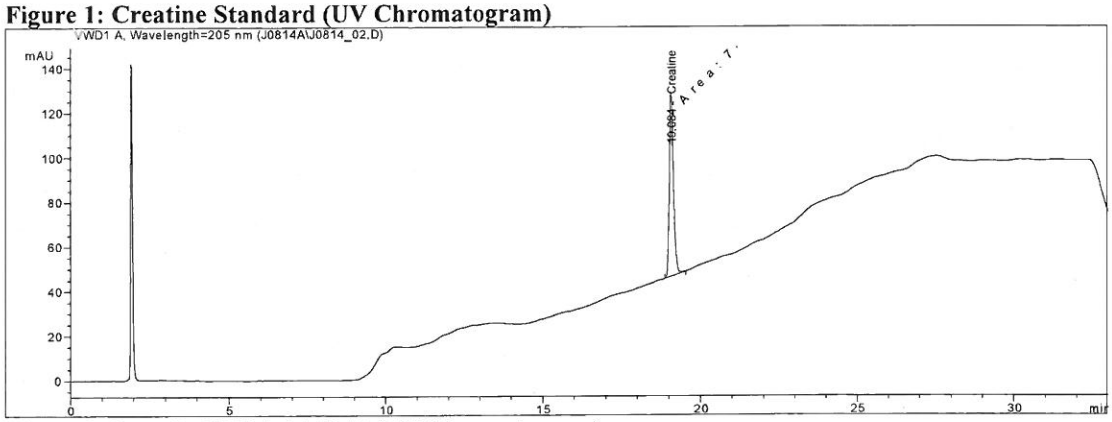
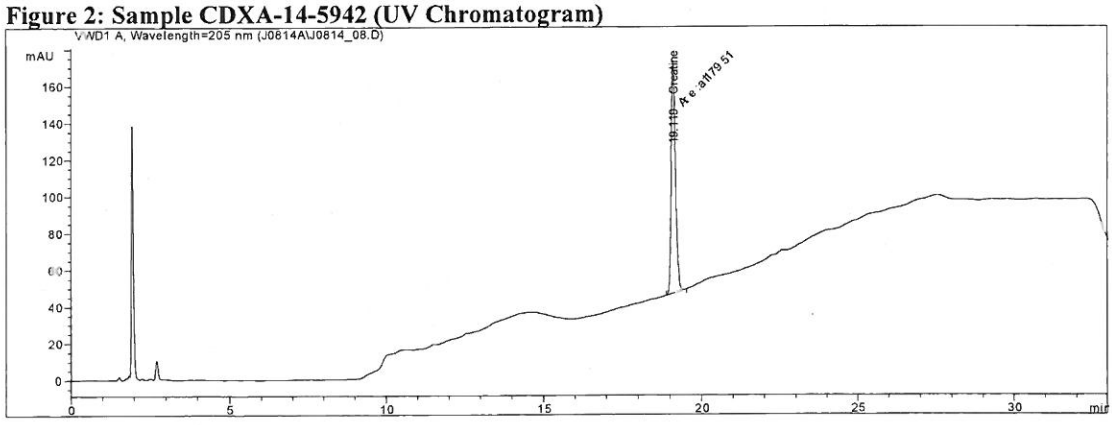


Figure 2: Sample CDXA-14-5942 (UV Chromatogram)



- ***REFERENCES***

ChromaDex SOP "Routine Laboratory Calculations"

Analytical Method: 99.1-CDXA-2.0-000318 "Creatine, Creatinol-O-Phosphate, and Creatinine by HPLC."

Laboratory Notebook	Page(s)
392	70

- ***REVISION HISTORY***

Revision Number	Document/Changes
00	New report

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www.chromadex.com

Analytical Test Report

Customer:	Barbat, Mansour & Suciu PLLC	Report Number:	CDXA-ATR-6695-00
Address (City, State):	Detroit, MI	Project Number:	ORD68542
Purchase Order:	Not Provided	Date Received:	26-Sep-14
Date of Report:	13-Oct-14	Test Location:	Boulder, CO

Assay: Amino Acids Base Panel of 21 by HPLC

Part Number: CDA-00100666-ATR

Prepared By: **Devon Cruz** — Chemist — 13-Oct-14 — Date

Reviewed By: **Richard Vigil** — Manager, Analytical Services — 13-Oct-14 — Date

Approved By: **Adriana Jones** — Quality Assurance — 13-Oct-14 — Date

Signed original on file at CDXA

SUMMARY

- ***SAMPLE(S)***

	Lot #	CDXA #
4 Dimension Nutrition Whey Phase	14114	CDXA-14-5942

- ***RESULTS***

Table 1 –CDXA-14-5942

Analyte	Units	Spec	Result	Reporting Limit
Aspartic acid	mg/serving		ND	340
Glutamic acid	mg/serving		ND	370
Serine	mg/serving		ND	270
Histidine	mg/serving		ND	390
Glycine	mg/serving		3220	--
Threonine	mg/serving		ND	300
Arginine	mg/serving		ND	440
Alanine	mg/serving		ND	230
Tyrosine	mg/serving		ND	460
Cystine	mg/serving		ND	610
Valine	mg/serving		ND	300
Methionine	mg/serving		ND	380
Phenylalanine	mg/serving		ND	420
Isoleucine	mg/serving		ND	330
Leucine	mg/serving		ND	330
Lysine	mg/serving		ND	370
Proline	mg/serving		ND	530
Asparagine	mg/serving		ND	110
Glutamine	mg/serving		ND	110
Tryptophan	mg/serving		ND	99
Hydroxyproline	mg/serving		ND	110

Serving Size = 35 g

ND – Not detected above reporting Limit

BRL – Below reporting limit (compound detected below RL)

ANALYTICAL METHOD

- ***STANDARD(S)*** *All standards supplied by ChromaDex, unless otherwise specified.*

	Part/Lot #
Ready to Inject Amino Acid Mix	Agilent-5061-3330
Norvaline	Agilent-BCBL0180V
Hydroxyproline	Agilent-BCBK363V
Asparagine	ASB-00011043
Glutamine	Agilent-BCBK3328V
Tryptophan	Agilent-BCBB7661

- ***LABORATORY SUPPLIES***

Analytical Balance
Ultrasonication Bath
Assorted and Volumetric glassware
Syringes and Syringe Filters
HPLC glass vials and caps

- ***SOLVENTS AND REAGENTS***

Milli-Q Water
Methanol (MeOH)
Sodium Phosphate, dibasic (Na_2HPO_4)
2 N KOH
Acetonitrile (ACN)
Hydrochloric acid (HCl)
OPA (o-phthalaldehyde) – Derivatization reagent for primary amino acids
FMOC (9-fluorenyl-methyl chloroformate) – Derivatization reagent for secondary amino acids
Borate buffer (0.4N in water)
Phosphoric Acid (H_3PO_4)

- ***SOLUTION PREPARATION***

Diluent – 0.1 N HCl

The diluent was prepared by transferring 16.8 mL of HCl to a 2000 mL volumetric flask and diluting it to volume with water.

Mobile Phase A - 10 mM Na_2HPO_4, 10 mM $Na_2B_4O_7$ pH= 8.2

Solution was prepared by adding 2.8 g Na_2HPO_4 and 7.6 g of $Na_2B_4O_7$ to 2000 mL of water and stirring until completely dissolved. The pH was adjusted to 8.4 with 2.4 ml of HCl, followed by drop-wise addition of HCl until the pH was 8.2.

Mobile Phase B - 45:45:10 ACN-MeOH-Water

Solution was prepared by combining 900 mL Acetonitrile, 900 mL Methanol, and 200 mL Milli-Q water and mixing well.

Injection diluent
Add 40 ul of concentrated H_3PO_4 to 10 ml of water

- ***STANDARD PREPARATION***

Amino Acid Mix A Stock Standard – Includes the Amino Acids Alanine, Arginine, Aspartic Acid, Cystine, Glutamic Acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Proline, Serine, Threonine, Tyrosine, and Valine

A mixed amino acid standard containing 17 amino acids was purchased from Agilent and arrived in 0.1N HCl. Calibration standards were then prepared from this mixed stock by diluting with 0.1 N HCl.

Supplemental mixed standard- Asparagine, Glutamine, Tryptophan, and Hydroxyproline
Mixed standard solution was prepared by weighing approximately 5 mg of Asparagine into a 50 mL volumetric flask. An aliquot of Glutamine, Tryptophan, and Hydroxyproline were added to the volumetric flask. 50 mL of diluent were added, and the flask was sonicated for 30 minutes.

Internal Standard
Solution was prepared by weighing 50 mg of Norvaline into a 50 mL volumetric flask. Brought to volume with diluent and mixed well.

- ***SAMPLE PREPARATION***

Sample Preparation

Sample was prepared by weighing ~700 mg of sample into a 50 mL volumetric flask. 50 mL of diluent were added to the flask, and the solution was sonicated for 30 minutes. The solution was diluted 20x with diluent. The solution was then filtered. 900 µL of filtrate were combined with 100 µL of IS and mixed well.

- ***INSTRUMENT PARAMETERS***

Instrument	Agilent 1100 Series HPLC System
Detection	UV-Vis
Mobile Phase A	10 mM $Na_2B_4O_7$ pH= 8.2
Mobile Phase B	45:45:10 ACN-MeOH-Water

Gradient Program

Time (min)	%A	%B
0.0	98	2
0.5	98	2
20.0	43	57
20.1	0	100
23.5	0	100
23.6	98	2
25	98	2

Column	Agilent Zorbax Eclipse Plus C18 RR, 150 x 4.6mm, 3.5 µm
Flow Rate	1.5 mL/min

Detectior Settings:

	UV Detection
OPA Amino Acids:	338 nm, 10 nm bandwidth (bw) Reference 390, 20
FMOC-Amino Acids	262 nm, 16 nm bw Reference 324, 8

Injection Volume	Injector Program
Column Temperature	40 °C

Autosampler Injector Set-Up and Program:

Draw speed: 200 µL/min
Eject speed: 200uL/min
Draw Position: 0.0 mm
Equilibration Time 2.0 sec

Vial 1 = Borate Buffer (HPLC vial, screw-cap)
Vial 2 = Injection Diluent
Vial 3 = OPA (GC vial w/ insert, crimp-cap)
Vial 4 = FMOC (GC vial w/ insert, crimp-cap)
Vial 5 = Water (HPLC vial, no cap)
Vial 6 = Water (HPLC vial, no cap)
Vial 7 = Acetonitrile (HPLC vial, no cap)

Row	Action
1	Needle wash in Vial 6, 1 times
2	Needle wash in Vial 5, 1 times
3	Needle wash in Vial 7, 1 times
4	Draw 2.5 µL from Vial 1 def. speed, def. offset
5	Draw 1.0 µL from Sample, def. speed, def. offset
6	Mix 3.5 µL "in seat", max. speed, 5 times
7	Wait 0.20 minutes
8	Draw 1.0 µL from Vial 3
9	Mix 4.5 µL in seat, max. speed, 10 times
10	Wait 1.00 min
11	Draw 0.4 µL from Vial 4 def. speed, def. offset
12	Mix 4.9 µL in seat, max. speed, 10 times
13	Wait 1.00 min
14	Draw 32. µL from Vial 2 def. speed, def. offset
15	Mix 36.9 µL in seat, max. speed, 8 times
16	Inject
17	Wait 0.20 min
18	Valve bypass

DATA

- ***FIGURES***

Figure 1: Amino Acids Mix Standard (UV Chromatogram) Base Panel (17)

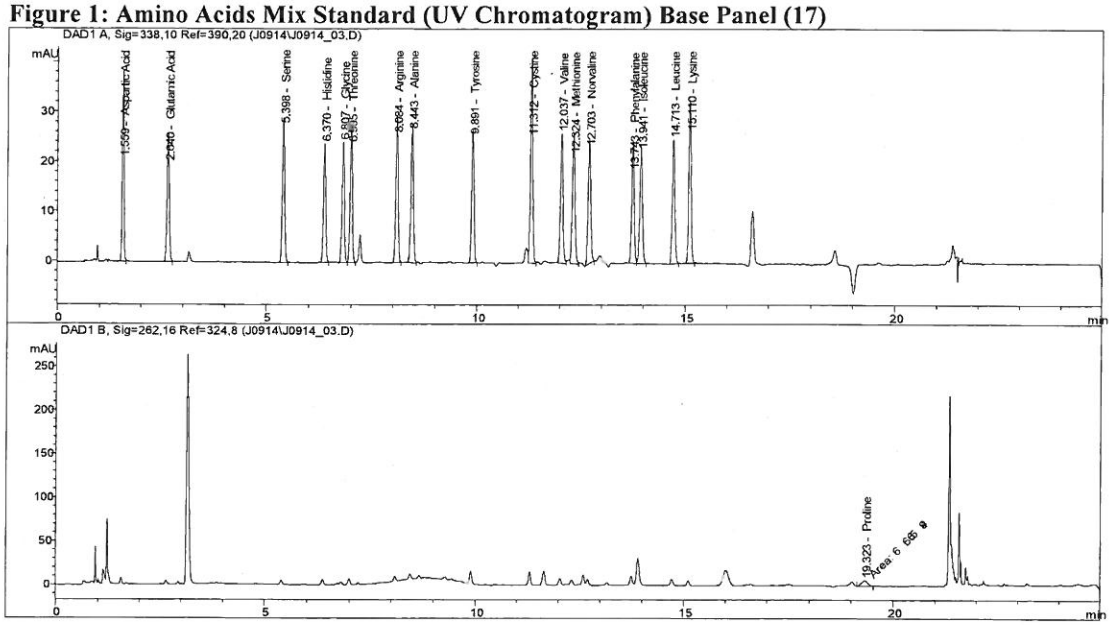


Figure 2: Supplemental Amino Acids Standards Mix (UV Chromatogram)

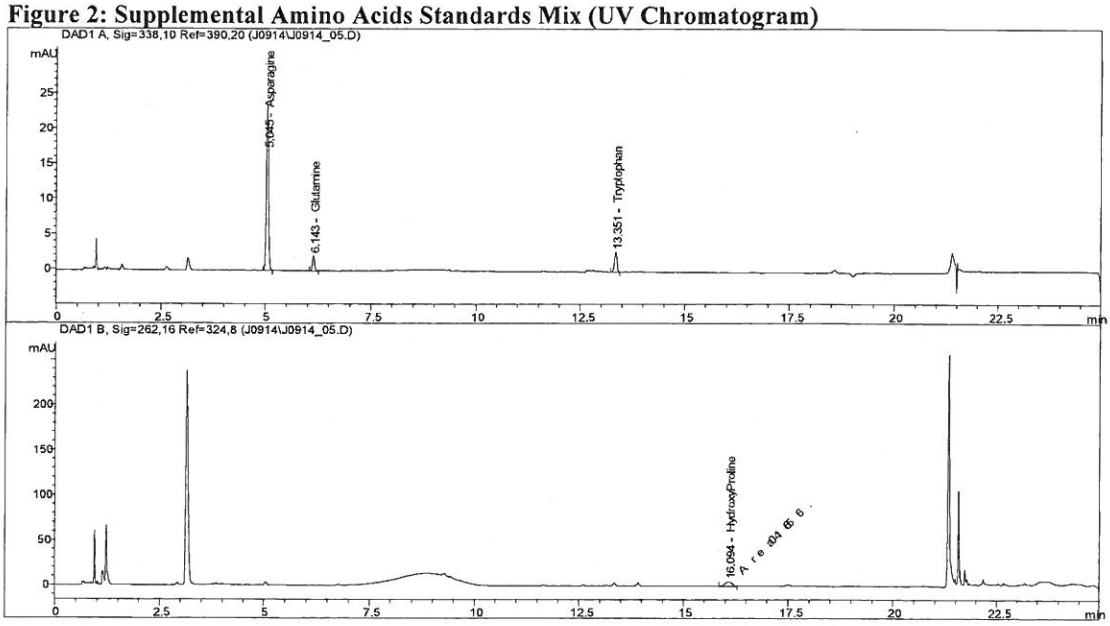
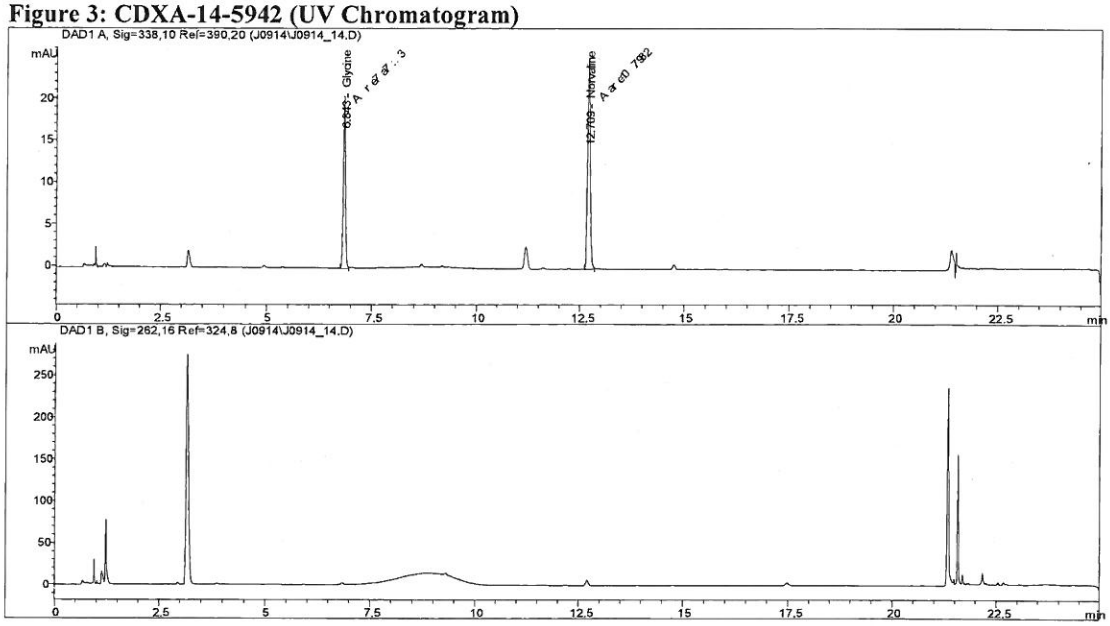


Figure 3: CDXA-14-5942 (UV Chromatogram)



- ***REFERENCES***

Analytical Method: 99.1-CD-5.0-000186 "Amino Acids by Pre-Column Derivitization HPLC."

Laboratory Notebook	Page(s)
385	149-150
362	156
402	6

- ***REVISION HISTORY***

Revision Number	Document/Changes
00	New report