

## Analytical Test Report

Customer: Tigerfitness.com      Report Number: CDXA-ATR-9186-00  
Address (City, State): Mason, OH      Project Number: ORD86309  
Purchase Order: Not Provided      Date Received: 14-Jul-16  
Date of Report: 27-Jul-16      Test Location: Boulder, CO  
  
Assay: Free Amino Acids Profile by HPLC (Complete Panel of 21)  
Part Number: CDA-00100666-ATR

**Prepared By:** Tucker Oakley      27-Jul-16  
Analyst I      Date

**Reviewed By:** John Rowley      27-Jul-16  
Analyst I      Date

**Approved By:** \_\_\_\_\_      27-Jul-16  
Quality Assurance      Date

*Signed original on file at CDXA*

This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.

## SUMMARY

- **SAMPLE(S)**

MTS Whey Aussie Choc Biscuit	Lot # N/A	CDXA # CDXA-16-008939
------------------------------	--------------	--------------------------

- **RESULTS**

**Table 1 – Results CDXA-16-008939**

Analyte	Units	Spec.	Result	Reporting Limit
Alanine	g/serving	NA	ND	0.034
Arginine	g/serving	NA	ND	0.065
Asparagine	g/serving	NA	ND	0.015
Aspartic Acid	g/serving	NA	ND	0.050
Cystine	g/serving	NA	ND	0.090
Glutamic Acid	g/serving	NA	ND	0.055
Glutamine	g/serving	NA	ND	0.039
Glycine	g/serving	NA	ND	0.028
Histidine	g/serving	NA	ND	0.058
Hydroxyproline	g/serving	NA	ND	0.016
Isoleucine	g/serving	NA	ND	0.049
Leucine	g/serving	NA	ND	0.049
Lysine	g/serving	NA	ND	0.055
Methionine	g/serving	NA	ND	0.056
Phenylalanine	g/serving	NA	ND	0.062
Proline	g/serving	NA	ND	0.043
Serine	g/serving	NA	ND	0.039
Threonine	g/serving	NA	ND	0.045
Tryptophan	g/serving	NA	ND	0.015
Tyrosine	g/serving	NA	ND	0.068
Valine	g/serving	NA	ND	0.044

Serving Size: 36.6 g

*ND – Not detected*

*BRL –Compound detected below reporting limit.*

This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.

## ANALYTICAL METHOD

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

	<b>Part #</b>
Norvaline	Agilent-5062-2478
Ready to Inject Amino Acid Mix	Agilent-5061-3330
L-Glutamine	Agilent-BCBK3328V

- **LABORATORY SUPPLIES**

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

- **SOLVENTS AND REAGENTS**

Milli-Q Water  
 Methanol (MeOH)  
 Sodium Phosphate, dibasic (Na<sub>2</sub>HPO<sub>4</sub>)  
 Isopropanol (IPA)  
 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<sub>3</sub>PO<sub>4</sub>)

- **SOLUTION PREPARATION**

### **Diluent – 0.1 N HCl**

The diluent was prepared by adding 8.4 mL of HCl to 1000 mL of Milli-Q water and mixing well.

### **Mobile Phase A - 10 mM Na<sub>2</sub>HPO<sub>4</sub>, 10 mM Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> pH= 8.2**

Solution was prepared by adding 2.8 g Na<sub>2</sub>HPO<sub>4</sub> and 7.6 g of Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> 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 450 mL ACN, 450 mL MeOH and 100 mL Milli-Q water and mixing well.

### **Injection diluent**

Added 200 µL of concentrated H<sub>3</sub>PO<sub>4</sub> to 50 mL of water

- **STANDARD PREPARATION**

- **Internal Standard**

- Solution was prepared by weighing 50 mg of Norvaline into a 50 mL volumetric flask. The flask was brought to volume with diluent and mixed well.

- **Glutamine Standard**

- Weighed into volumetric flask. Added 80% total volume of 0.01N HCl. Sonicated until dissolved. Raised to final volume with 0.01N HCl, mixed well.

- **Asparagine, Tryptophan and Hydroxyproline Retention Time Mix**

- Weighed into volumetric flask. Added 80% total volume of 0.1N HCl. Sonicated until dissolved. Raised to final volume with 0.1N HCl, mixed well.

- **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 0.1 N HCl. Calibration standards were then prepared from this mixed stock by diluting with 0.1 N HCl.

- **SAMPLE PREPARATION**

- **Customer Sample**

- Approximately 500 mg of sample were weighed into a 10 mL scintillation vial. ~8 mL of diluent were added and the flask was sonicated for 30 minutes. The solution was re-equilibrated to ambient conditions then diluted to volume with diluent. The sample was then diluted 10x with diluent and mixed well. An aliquot of solution was filtered through a PTFE filter. 900 µL of filtrate and 100 µL of internal standard were combined in a HPLC vial and mixed well.

- **INSTRUMENT PARAMETERS**

Instrument	Agilent 1100 Series HPLC System
Detection	UV-Vis
Mobile Phase A	10 mM Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> 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
Detector Settings:	

	<b>UV Detection</b>
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

This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and/or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.

## Autosampler Injector Set-Up and Program:

Draw speed: 200  $\mu\text{L}/\text{min}$   
Eject speed: 200  $\mu\text{L}/\text{min}$   
Draw Position: 0.0 mm  
Equilibration Time 2.0 sec

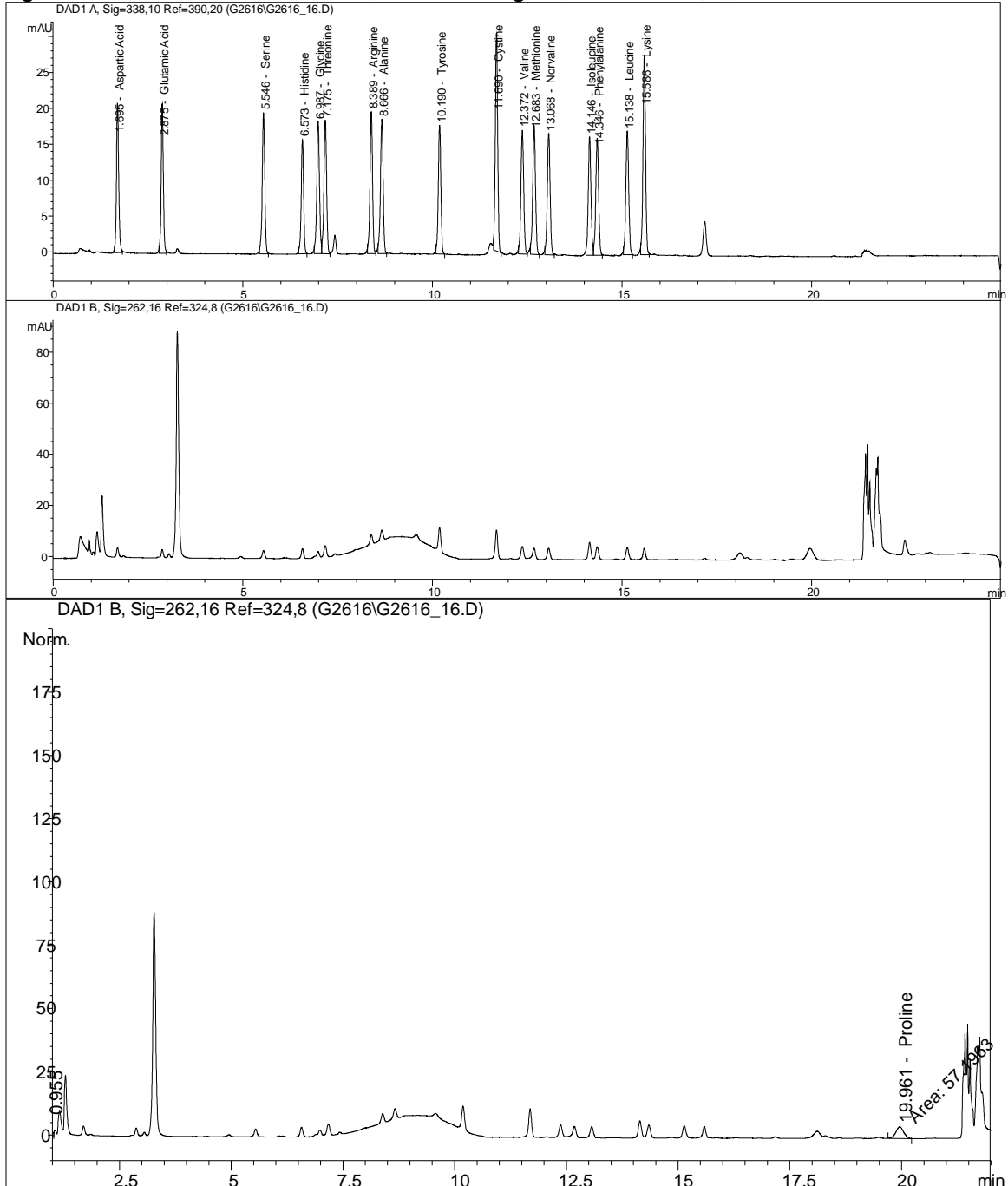
Vial 1 = Borate Buffer (HPLC vial, screw-cap)  
Vial 2 = Injection Diluent  
Vial 3 = OPA (GC vial w/ insert, crimp-cap)  
Vial 4 = FMOc (GC vial w/ insert, crimp-cap)  
Vial 5 = Water (HPLC vial, no cap)  
Vial 6 = Water (HPLC vial, no cap)  
Vial 7 = IPA (HPLC vial, no cap)

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 $\mu\text{L}$ from Vial 1 def. speed, def. offset
5	Draw 1.0 $\mu\text{L}$ from Sample, def. speed, def. offset
6	Mix 3.5 $\mu\text{L}$ "in seat", max. speed, 5 times
7	Wait 0.20 minutes
8	Draw 1.0 $\mu\text{L}$ from Vial 3
9	Mix 4.5 $\mu\text{L}$ in seat, max. speed, 10 times
10	Wait 1.00 min
11	Draw 0.4 $\mu\text{L}$ from Vial 4 def. speed, def. offset
12	Mix 4.9 $\mu\text{L}$ in seat, max. speed, 10 times
13	Wait 1.00 min
14	Draw 32. $\mu\text{L}$ from Vial 2 def. speed, def. offset
15	Mix 36.9 $\mu\text{L}$ in seat, max. speed, 8 times
16	Inject
17	Wait 0.20 min
18	Valve bypass

# DATA

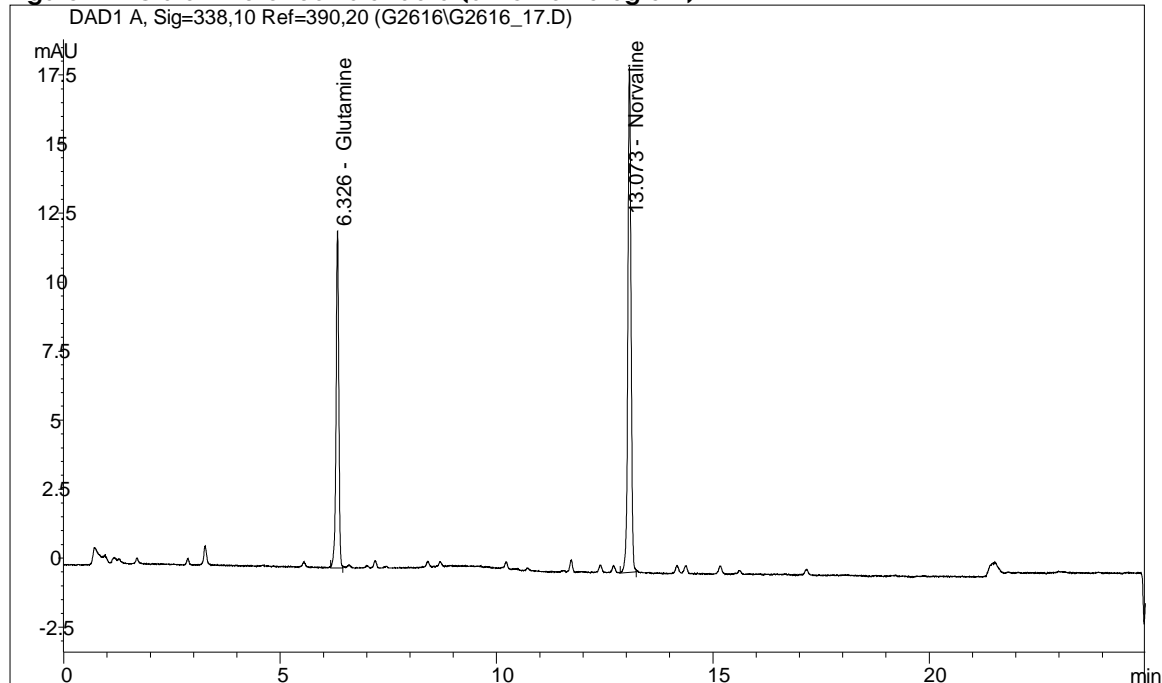
- FIGURES**

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

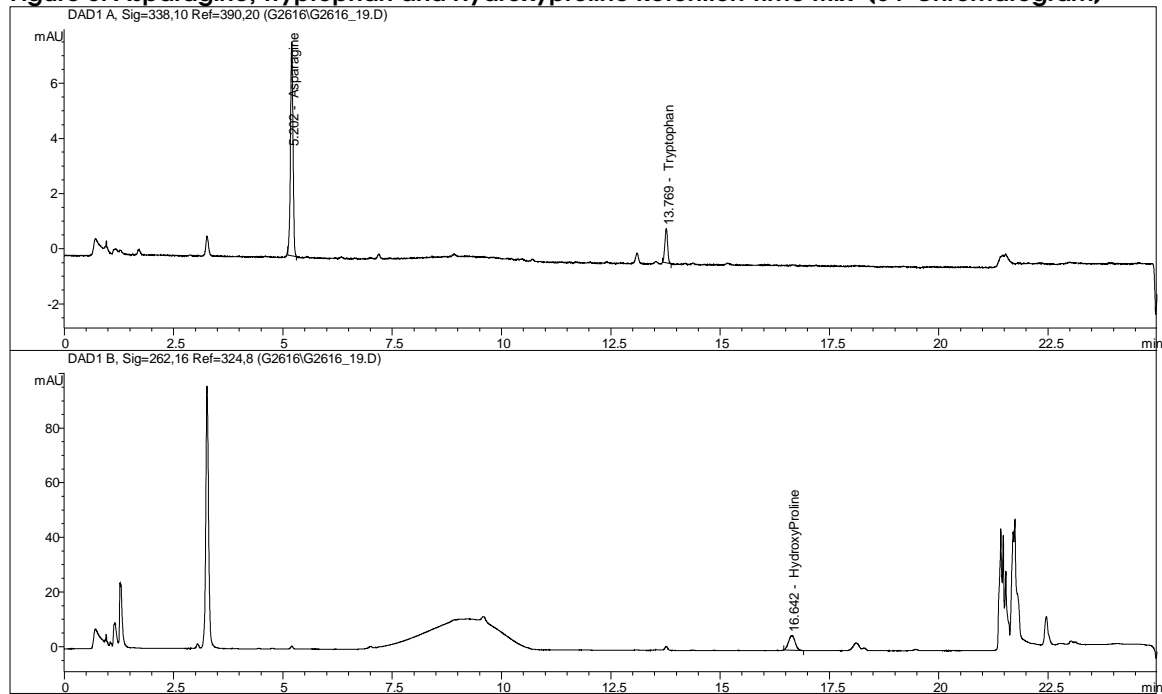


This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.

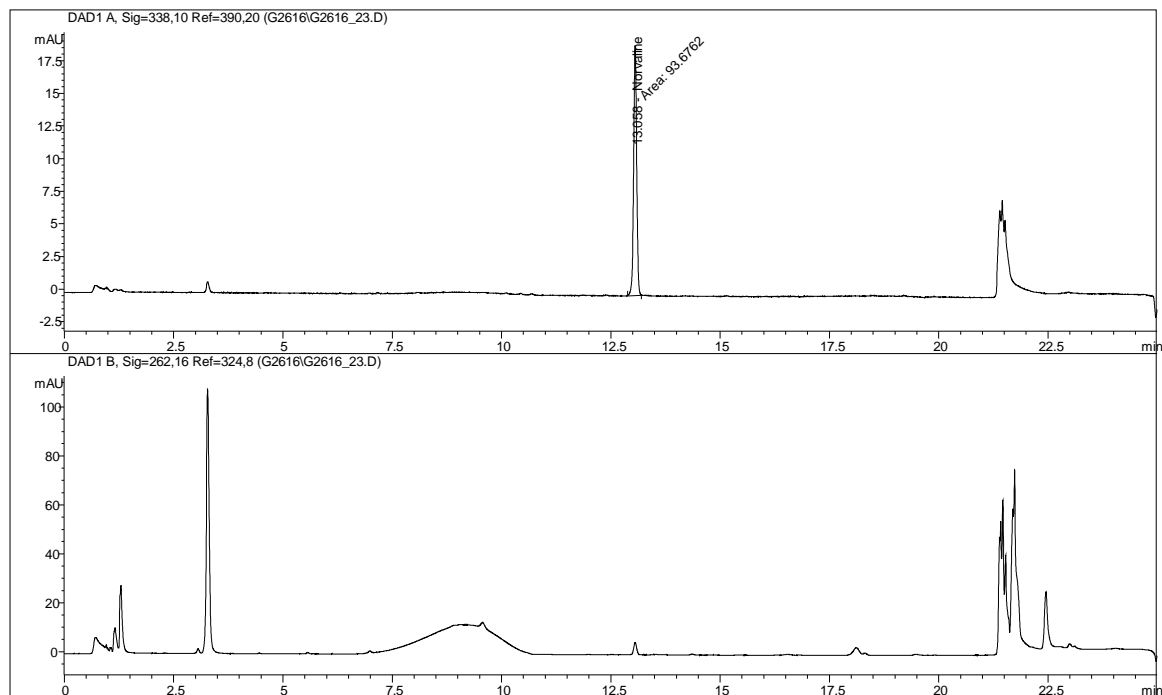
**Figure 2: L-Glutamine Check Standard (UV Chromatogram)**



**Figure 3: Asparagine, Tryptophan and Hydroxyproline Retention Time Mix (UV Chromatogram)**



This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.

**Figure 4: Sample CDXA-16-008939 (UV Chromatogram)**

This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.



- **REFERENCES**

ChromaDex SOP "Routine Laboratory Calculations"  
Analytical Method: 99.1-CDXA-7.0-000186 "Free Amino Acids by Pre-Column Derivatization HPLC."

<u>Laboratory Notebook</u>	<u>Page(s)</u>
443	100
445	84

- **REVISION HISTORY**

<u>Revision Number</u>	<u>Document/Changes</u>
00	New report

This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.



## Analytical Results Sheet

Customer:	Tigerfitness.com	Report Number:	CDXA-ARS-31590-00
Address (City, State):	Mason, OH	Project Number:	ORD86309
Sample Name:	MTS Whey Aussie Choc Biscuit	Date Received:	14-Jul-16
Sample Lot:	N/A	Purchase Order:	Not Provided
CDXA Number:	CDXA-16-008939	Date of Report:	28-Jul-16
Assay:	Taurine by HPLC	Page:	2 of 2
Part Number:	CDA-00100197-ARS	Test Location:	Boulder, CO
Method:	99.1-CDXA-7.0-000186		

Analyte	Units	Spec.	Result	Reporting Limit
Taurine	g/serving	NA	ND	0.28

Serving Size: 36.6g

Verified: Anita Sokovic

QA Approved:

*Signed original on file at CDXA*

This product analysis is subject to our "Standard Terms and Conditions for the Purchase and Sale of ChromaDex Products and or Services," a copy of which has been provided to our client and is incorporated herein by this reference. As more specifically set forth therein, this product analysis is for the benefit of our client only, may not be relied upon by any other party without our prior written consent, relates solely to the sample(s) provided to us by our client and therefore cannot be applied to any other material or sample. Unless otherwise noted, samples were received in acceptable condition and analyzed as received. This document may not be printed in part without the explicit permission of ChromaDex.

ND – Not Detected

BRL – Below reporting limit (compound detected below RL)

