Summary of Metabolic Technologies' Quality Assurance Program

Metabolic Technologies (MTI) is located in Ames, IA and sources Calcium β-hydroxy-β-methylbutyrate (CaHMB) product from TSI Health Sciences, which produces the CaHMB at their Chinese operations location. The main offices are located in Shanghai China. TSI has been manufacturing CaHMB for MTI for more than 10 years. TSI maintains a dedicated GMP manufacturing facility for the manufacture of HMB.

Quality Control: MTI maintains a cGLP analytical laboratory located in the MTI facility at the Iowa State University Research Park. MTI operates this laboratory based upon a Standard Operating Protocol (SOP) system. The current laboratory director, John A. Rathmacher, PhD, has over 20 years of experience in HMB analysis. A brief outline of MTI's Quality Control Program is as follows:

1) TSI manufactures the HMB per their GMP protocol.

2) The TSI analytical laboratory then generates a Certificate of Analysis (C of A) for each lot.

3) TSI sends MTI a pre-approval sample of each lot manufactured and the MTI laboratory performs a second analysis for HMB potency and purity on our HPLC systems.

4) Once the lot has been approved by our Quality Control, an approval is issued. Only then may this lot be shipped to our facility for distribution.

5) Third party analysis of and verification of the C of A on selected random lots is performed approximately twice yearly. The independent testing laboratory used is Minnesota Valley Testing Laboratories Inc. located in New Ulm, MN. These results are compared with the C of A as well as against the CaHMB General Product Specifications (Appendix A).

Standard Operating Procedures: The following table contains a list of SOPs pertinent to our testing of HMB as well as for the distribution of HMB to customers.

Table 1. List of SOPs pertinent to HMB Quality testing and Distribution of HMB

SOP Number	Sop Name
110-03	HPLC(HMB)
153-02	DHEA
501-03	QC Sample Handling
502-05	Handling Instructions for Raw CaHMB Quality Control Samples
509-01	Independent Lab Testing (MVTL)
531-03	Policy and Procedures for Visitor Registration at MTI and MTI Biotech
532-01	Policy for Monitoring Security and Storage Conditions of CaHMB
533-01	Policy and Procedures for Ordering, Receiving, and Shipping CaHMB
534-01	Policy and Procedures for Conducting Mock Product Recalls at MTI and MTI Biotech
535-01	Policy and Procedures for Conducting Mock Product Recalls at MTI and MTI Biotech
536-01	Policy and Procedures for Recording and Reporting Adverse Events and Consumer and Manufacturer Complaints for HMB Products Sold by MTI
537-02	Policy and Procedures for FDA Inspections

Certificates of Analysis and Analytical Data: TSI issued original C of As and MTI certified C of As for three lots of CaHMB are shown in Appendix B. As indicated these lots were approved prior to receipt at MTI by the MTI analytical laboratory. Every lot of CaHMB is tested in two separate testing laboratories using independent testing procedures before being approved for inventory and distribution. MTI analyses and approval data are shown in Appendix C.

Lastly, samples of random CaHMB lots are obtained directly from the manufacturer, TSI, and sent to an independent testing laboratory, Minnesota Valley Testing Laboratory, Inc. The independent laboratory conducts verification of microbial and metal test results reported by TSI on their C of A. Additional testing is also included for moisture, additional metals, and major food pathogens. The independent laboratory test results for the 3 lots are shown in Appendix D.

Summary: MTI has established a three tier testing approach which provides a high degree of quality control. Additionally, the pre-approval process used by MTI eliminates any concern that unapproved HMB could enter the distribution supply. MTI has been in the forefront of establishing and maintaining a superior standard of quality control and quality assurance and will continue to strive to fully meet or exceed any new standards implemented in future regulations.

Appendix A

Metabolic Technologies Incorporated

Iowa State University Research Park
2711 South Loop Drive, Suite 4400
Ames, Iowa 50010

Product Composition-Calcium HMB

Rev. 03-01	Supersedes: 02-01.1
Chemical Name	**Calcium β-hydroxy-β-methylbutyrate monohydrate**
Product Name	**HMB, Food Grade**
Product Number	HMB-0001FG
Kosher Status	Kosher Approved
Molecular Formula	$Ca(C_5H_9O_3)_2 \cdot H_2O$
Molecular Weight	292
CAS	135236-72-5
Synonyms	Calcium Hydroxy-Isovaleric Acid
	Calcium β-hydroxy-β-methylbutyrate monohydrate contains not less than 97 % and not more than 104 % calcium β-hydroxy-β-methylbutyrate monohydrate as calculated from the analysis.
Characteristics	White powder
Taste[1]	Passes test per agreed upon standard
Solubility	Easily soluble in water up to 25% solution
Particle Size	mesh size 20: 100 % passage
Bulk Density, poured[2]	min 0.42 g/cc
Bulk Density, tapped[2]	min 0.65 g/cc
β-hydroxy-β-methylbutyrate[3]	min. 76%, weight max. 82%, weight
Calcium	min. 12%, weight max. 16%, weight
Arsenic[4]	Less than 1 mg/kg
Lead[4]	Less than 1 mg/kg
Hydrated Water[5]	min. 3.0%, weight max. 7.5%, weight
Acetate[3]	Less than or equal to 2%, weight
Dimethylacrylic Acid[3]	Less than or equal to 150 mg/kg
Microbial analysis	Total aerobic count max. 1000/g Yeast and mold max. 100/g Salmonella Negative E.Coli Negative

[1]MTI SOP 150-02. MTI will supply a suitable standard for tests.

[2]MTI SOP 510-01.

[3]Determined by High Pressure Liquid Chromatography (HPLC) using a Reverse Phase C-18 column and 0.02 molar phosphate buffer at pH 7.0. Flow rate is 1 mL/min. Peaks are detected at 214 nanometers and approximate retention times are 2.95 minutes for Acetate, 3.5 minutes for β-hydroxy-β-methylbutyrate, and 6.1 minutes for 3,3-Dimethylacrylic Acid, MTI SOP 110-02.

[4]Total by AA furnace or ICP-MS.

[5]Moisture by Karl Fischer.

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fx 515 296.0908

Metabolic Technologies Inc. 2711 S. Loop Dr. Suite 4400 Ames IA 50010 USA
Phone 515-296-9916 FAX 515-296-0908

website: http://MetTechInc.Com | email: mti@mti-hmb.com

Appendix B

TSI HEALTH SCIENCES

CERTIFICATE OF ANALYSIS

Calcium β-Hydroxy β-Methyl Butyrate Monohydrate

Item No.	HMB001	**Mfg Date**	Oct.31,2011
Lot No.	11080837	**Retest Date**	Oct.30,2014

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT. 0.55 g/ml	0.58g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.74g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	102.2%
	HMB	HPLC	77.0-82.0%	81.9%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca^{2+})	Titration	13.0-15.0%	13.6%
	Acetate	HPLC	NMT 1%	Negative
	Moisture	USP<921 I>	5.0-7.5%	5.0%
	Arsenic (As)	USP<851>	NMT 1.00 ppm	<0.10ppm
	Lead (Pb)	USP<851>	NMT 1.00 ppm	<0.10ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	<10 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	<10 cfu/g
	E. coli	USP<62>	Negative	Negative
	Salmonella	USP<62>	Negative	Negative

Prepared by Yan Li

Approved by Maryman Meng — Date Nov. 29, 2011
QC Manager
TSI Health Sciences, Inc.

Xian Chen — Date Nov. 29, 2011
QA Supervisor
TSI Health Sciences, Inc.

MASTER
IF IN RED

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Metabolic Technologies Incorporated

Iowa State University Research Park
2711 South Loop Drive, Suite 4400
Ames, Iowa 50010

CERTIFICATE OF ANALYSIS

Calcium β-Hydroxy β-Methyl Butyrate Monohydrate

Item No.	HMB001	**Mfg Date**	Oct.31,2011
Lot No.	11080838	**Retest Date**	Oct.30,2014

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT. 0.55 g/ml	0.58g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.74g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	102.3%
	HMB	HPLC	77.0-82.0%	81.9%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca^{2+})	Titration	13.0-15.0%	13.5%
	Acetate	HPLC	NMT 1%	Negative
	Moisture	USP<921 I>	5.0-7.5%	5.1%
	Arsenic (As)	USP<851>	NMT 1.00 ppm	<0.10ppm
	Lead (Pb)	USP<851>	NMT 1.00 ppm	<0.10ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	15 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	<10 cfu/g
	E. coli	USP<62>	Negative	Negative
	Salmonella	USP<62>	Negative	Negative

Prepared by Yan Li

Approved by Mingyuan Meng — Date Feb. 09, 2012
QC Manager
TSI Health Sciences, Inc.

Xian Chen — Date Feb. 09, 2012
QA Supervisor
TSI Health Sciences, Inc.

Manufactured by TSI Health Sciences, Inc. Shanghai, CHINA

John C. Fuller Jr. Date: 22-Feb-12

John C. Fuller, Jr., PhD Research Scientist, Metabolic Technologies, Inc.

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TSI HEALTH SCIENCES

CERTIFICATE OF ANALYSIS

Calcium β-Hydroxy β-Methyl Butyrate Monohydrate

Item No.	HMB001	**Mfg Date**	Oct.31,2011
Lot No.	11080838	**Retest Date**	Oct.30,2014

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT. 0.55 g/ml	0.58g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.74g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	102.3%
	HMB	HPLC	77.0-82.0%	81.9%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca^{2+})	Titration	13.0-15.0%	13.5%
	Acetate	HPLC	NMT 1%	Negative
	Moisture	USP<921 I>	5.0-7.5%	5.1%
	Arsenic (As)	USP<851>	NMT 1.00 ppm	<0.10ppm
	Lead (Pb)	USP<851>	NMT 1.00 ppm	<0.10ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	15 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	<10 cfu/g
	E. coli	USP<62>	Negative	Negative
	Salmonella	USP<62>	Negative	Negative

Prepared by Yan Li

Approved by Mingyuan Meng Date Feb. 09, 2012
QC Manager
TSI Health Sciences, Inc.

Xian Chen Date Feb. 09, 2012
QA Supervisor
TSI Health Sciences, Inc.

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Metabolic Technologies Incorporated

Iowa State University Research Park
2711 South Loop Drive, Suite 4400
Ames, Iowa 50010

CERTIFICATE OF ANALYSIS

Calcium β-Hydroxy β-Methyl Butyrate Monohydrate

Item No.	HMB001	**Mfg Date**	Nov.19,2010
Lot No.	10111125	**Retest Date**	Nov.18,2013

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT. 0.55 g/ml	0.61g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.81g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	99.2%
	HMB	HPLC	77.0-82.0%	79.5%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca^{2+})	Titration	13.0-15.0%	13.1%
	Acetate	HPLC	NMT 1%	0.1%
	Moisture	USP<921 I>	5.0-7.5%	5.8%
	Arsenic (As)	USP<851>	NMT 1.00 ppm	<0.10ppm
	Lead (Pb)	USP<851>	NMT 1.00 ppm	<0.10ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	<10 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	<10 cfu/g
	E. coli	USP<62>	Negative	Negative
	Salmonella	USP<62>	Negative	Negative

Prepared by Yan Li

Approved by Mingyuan Meng — Date Nov. 29, 2010
QC Manager
TSI Health Sciences, Inc.

Hailei Zhou — Date Nov. 29, 2010
QA Supervisor
TSI Health Sciences, Inc.

Manufactured by TSI Health Sciences, Inc. Shanghai, CHINA

John C. Fuller Jr. Date: 5th Jan 11

John C. Fuller, Jr., PhD Research Scientist, Metabolic Technologies, Inc.

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TSI HEALTH SCIENCES

CERTIFICATE OF ANALYSIS

Calcium β-Hydroxy β-Methyl Butyrate Monohydrate

Item No.	HMB001	**Mfg Date**	Nov.19,2010
Lot No.	10111125	**Retest Date**	Nov.18,2013

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT. 0.55 g/ml	0.61g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.81g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	99.2%
	HMB	HPLC	77.0-82.0%	79.5%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca^{2+})	Titration	13.0-15.0%	13.1%
	Acetate	HPLC	NMT 1%	0.1%
	Moisture	USP<921 I>	5.0-7.5%	5.8%
	Arsenic (As)	USP<851>	NMT 1.00 ppm	<0.10ppm
	Lead (Pb)	USP<851>	NMT 1.00 ppm	<0.10ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	<10 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	<10 cfu/g
	E. coli	USP<62>	Negative	Negative
	Salmonella	USP<62>	Negative	Negative

Prepared by Yan Li

Approved by Mingyuan Meng Date Nov. 29, 2010
QC Manager
TSI Health Sciences, Inc.

Haifei Zhou Date Nov. 29, 2010
QA Supervisor
TSI Health Sciences, Inc.

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CERTIFICATE OF ANALYSIS

Calcium β-Hydroxy β-Methyl Butyrate Monohydrate

Item No.	HMB001	**Mfg Date**	Oct.31,2011
Lot No.	11080837	**Retest Date**	Oct.30,2014

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT. 0.55 g/ml	0.58g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.74g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	102.2%
	HMB	HPLC	77.0-82.0%	81.9%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca^{2+})	Titration	13.0-15.0%	13.6%
	Acetate	HPLC	NMT 1%	Negative
	Moisture	USP<921 I>	5.0-7.5%	5.0%
	Arsenic (As)	USP<851>	NMT 1.00 ppm	<0.10ppm
	Lead (Pb)	USP<851>	NMT 1.00 ppm	<0.10ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	<10 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	<10 cfu/g
	E. coli	USP<62>	Negative	Negative
	Salmonella	USP<62>	Negative	Negative

Prepared by Yan Li

Approved by Maryan Meng — Date Nov. 29, 2011
QC Manager
TSI Health Sciences, Inc.

Xian Chen — Date Nov. 29, 2011
QA Supervisor
TSI Health Sciences, Inc.

Manufactured by TSI Health Sciences, Inc., Shanghai, CHINA

John C. Fuller Jr. Date: 6-Jan-12

John C. Fuller, Jr., PhD Research Scientist, Metabolic Technologies, Inc.

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Appendix C

Laboratory Analysis Sample Tracking-Form B

Metabolic Technologies, Inc.
2711 S. Loop Dr., Suite 4400

Ames, IA 50010

Date: 2 Dec. 11 Initials: JMS

Sample ID: 1112-100-02 Initials: JMS

Courier: UPS Initials: JMS

Received from: TSI Initials: JMS

Manufacturer/ Sender Lot Number(s): TSI 11080837

CA HMB Initials: JMS

Seals/Package Received Intact? Y Initials: JMS

Analyses Requested: (circle all that apply) HPLC, NMR, Capsule lot analysis, HPLC-arg/gln, pH, GC/MS, Taste other: Initials: JMS

Analyses Performed: HMB Assay# 1916.11 Date: 8 Dec 11 Initials: JAR

DHEA Assay# 190.11 Date: 8 Dec 11 Initials: JAR

HMB 189.11 Date: 5 Dec 11 Initials: JAR

MUTL Date: 20 Dec 11 Initials: JAR

Disposition (Returned/QA Retain/Disposed):

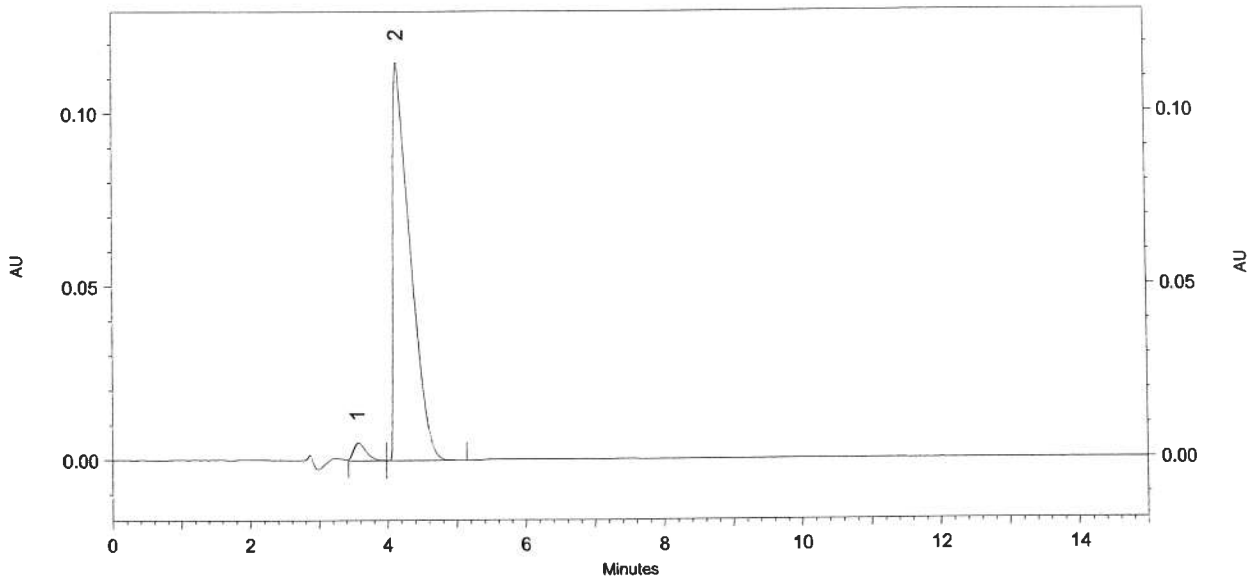
2011 A Date: 8 Dec 11 Initials: JAR

Date: Initials:

WITNESS: [signature] **DATE:** 8 Dec 11

Metabolic Technologies Inc
Iowa State University Research Park
2711s. Loop Dr., Ste 4400
Ames, Iowa 50010

File : C:\32Karat\Projects\HMB\Data\ma189_11\s21492a189_11.dat
Method : C:\32Karat\Projects\HMB\Method\RPC18methods\HMBmethod29may03.met
Sample ID : s21492
Vial : 10
Volume : 3
Acquired : 12/2/11 6:58:30 PM
Printed : 12/5/11 8:06:40 AM
File Desc. : MTI 1112-100-02 TSI 11080837



Det
166
Results

Pk #	Name	Retention Time	Area	Area Percent	Height	Height Percent	Width
1	DIOL	3.567	67450	3.3	5201	4.3	0.55
2	HMB	4.167	1961775	96.7	115037	95.7	1.17
Totals			2029225	100.0	120238	100.0	

CAHMB PRODUCTION LOT APPROVAL-Form C

Metabolic Technologies Inc.
2711 S. Loop Dr. Suite 4400
Ames, IA 50010

Date of Lot Production: 31 Oct 2011 Initials: JAR Date: 8 Dec 11

Manufacturer: TSI ~~Hell~~ Health Sciences Initials: JAR Date: 8 Dec 11

Date Sample Received: 2 Dec 11 Initials: JAR Date: 8 Dec 11

MTI Sample Number: 1112-100-02 Initials: JAR Date: 8 Dec 11

Analyses Performed/Results

Analysis	Result (Pass/Fail)	Criteria	Date	Initials
HMB	Pass	HPLC	8 Dec 11	JAC
DHEA	Pass	GC/MS	8 Dec 11	JAC

Did This Lot Pass Analysis: yes Signature: [signature] Date: 8 Dec 11

If No Reason for Failure: _____ Initials: _____ Date: _____
If No Status of this Lot: _____ Initials: _____ Date: _____

WITNESS: [signature] **DATE:** 8 Dec 11

Quality Control Form C

Laboratory Analysis Sample Tracking-Form B

Metabolic Technologies, Inc.
2711 S. Loop Dr., Suite 4400

Ames, IA 50010

Date: 2. Dec. 11 Initials: JMS

Sample ID: 1112-100-03 Initials: JMS

Courier: UPS Initials: JMS

Received from: TSI Initials: JMS

Manufacturer/ Sender Lot Number(s): TSI ~~1112-100-03~~

11080838 CAHMB Initials: JMS

Seals/Package Received Intact? y Initials: JMS

Analyses Requested: (circle all that apply) HPLC, NMR, Capsule lot analysis, HPLC-arg/gln, pH, GC/MS, Taste other: Initials: JMS

Analyses Performed: HMB ~~189~~ Assay# 189.11 Date: 8 Dec 11 Initials: JAR

HMB Assay# 191.11 Date: 8 Dec 11 Initials: JAR

DHBA 190.11 Date: 8 Dec 11 Initials: JAR

MVTC Date: 20 Dec 11 Initials: JAR

Disposition (Returned/QA Retain/Disposed):

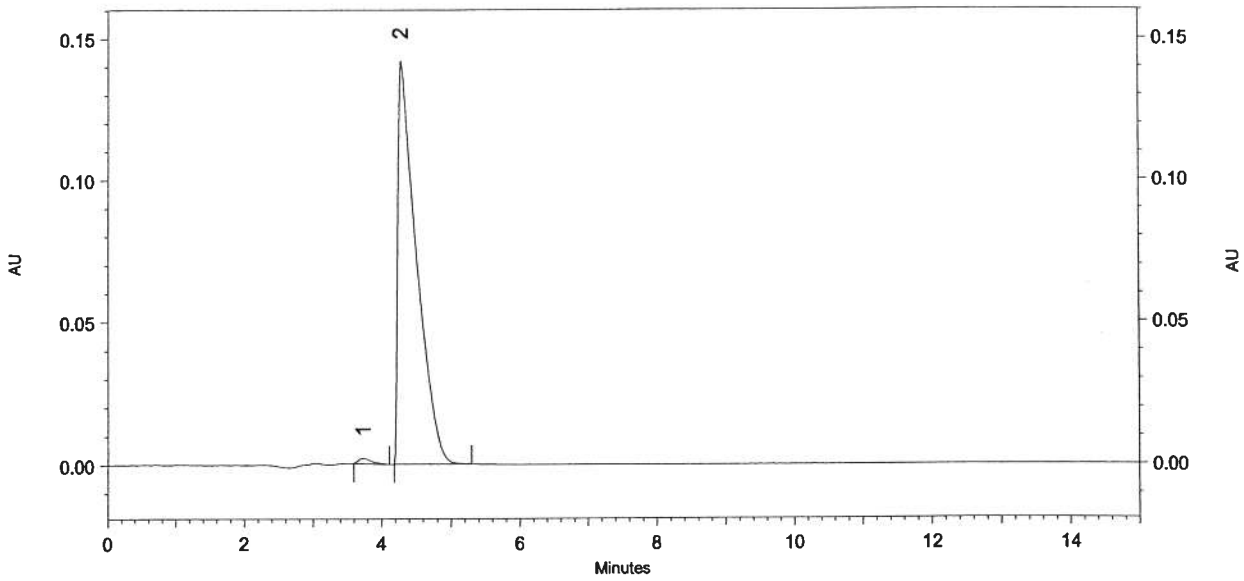
2011 A Date: 8 Dec 11 Initials: JAR

Date: Initials:

WITNESS: [signature] **DATE:** 11 Dec 11

Metabolic Technologies Inc
Iowa State University Research Park
2711s. Loop Dr., Ste 4400
Ames, Iowa 50010

File : C:\32Karat\Projects\HMB\Data\ma168_10\s20683a168_10.dat
Method : C:\32Karat\Projects\HMB\Method\RPC18methods\HMBmethod29may03.met
Sample ID : s20683
Vial : 10
Volume : 4
Acquired : 12/16/10 9:32:03 AM
Printed : 12/16/10 9:32:04 AM
File Desc. : MTI 1012-100-03 TSI 10111125



Det
166
Results

Pk #	Name	Retention Time	Area	Area Percent	Height	Height Percent	Width
1	DIOL	3.733	25956	1.0	1904	1.3	0.52
2	HMB	4.283	2616668	99.0	141848	98.7	1.12
Totals			2642624	100.0	143752	100.0	

CAHMB PRODUCTION LOT APPROVAL-Form C

Metabolic Technologies Inc.
2711 S. Loop Dr. Suite 4400
Ames, IA 50010

Date of Lot Production: 19 NOV 2010 Initials: JAR Date: 17 Dec 2010

Manufacturer: TSI Health Sciences Initials: JAR Date: 17 Dec 2010

Date Sample Received: 15 Dec 2010 Initials: JAR Date: 17 Dec 2010

MTI Sample Number: MTI 1012-100-03 Initials: JAR Date: 17 Dec 2010

Analyses Performed/Results

Analysis	Result (Pass/Fail)	Criteria	Date	Initials
~~HPLC~~ HMB	Pass	HPLC	17Dec10	JAR
DHEA	Pass	GC/MS	17Dec10	JAR

Did This Lot Pass Analysis: yes Signature: [signature] Date: 17 Dec 10

If No Reason for Failure: _____ Initials: _____ Date: _____
If No Status of this Lot: _____ Initials: _____ Date: _____

WITNESS: [signature] **DATE:** 17 Dec 10

Quality Control Form C

Laboratory Analysis Sample Tracking-Form B

Metabolic Technologies, Inc.
2711 S. Loop Dr., Suite 4400

Ames, IA 50010

Date: 15 Dec 10 Initials: JMU

Sample ID: 1012-100-03 Initials: JMU

Courier: UPS Initials: JMU

Received from: TSI Initials: JMU

Manufacturer/ Sender Lot Number(s): TSI 1011112 ~~6~~ 5 JAR

Initials: JMU

Seals/Package Received Intact? yes Initials: JMU

Analyses Requested: (circle all that apply) HPLC, NMR, Capsule lot analysis, HPLC-arg/gln, pH, GC/MS, Taste other: MUTC Initials: JMU

Analyses Performed: HPLC Assay# 168.10 Date: 16 Dec 10 Initials: JAR

DHEA Assay# 169.10 Date: 17 Dec 10 Initials: JAR

Date: Initials:

Date: Initials:

Disposition (Returned/QA Retain/Disposed):

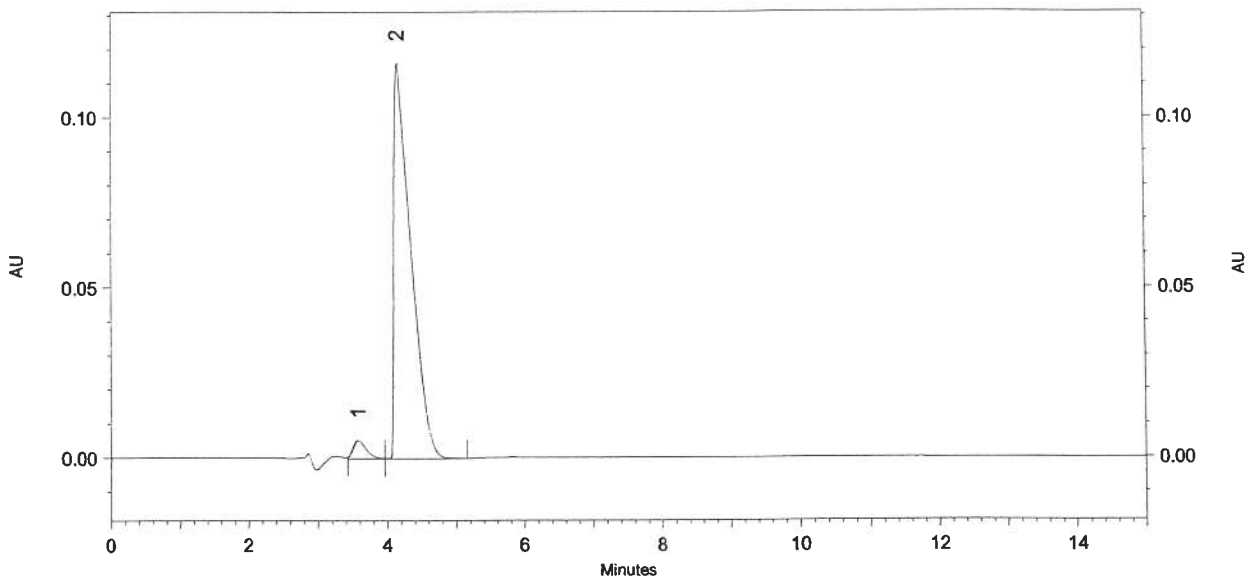
45 B Date: 17 Dec 10 Initials: JAR

Date: Initials:

WITNESS: [signature] **DATE:** 17 Dec 10

Metabolic Technologies Inc
Iowa State University Research Park
2711s. Loop Dr., Ste 4400
Ames, Iowa 50010

File : C:\32Karat\Projects\HMB\Data\ma189_11\s21496a189_11.dat
Method : C:\32Karat\Projects\HMB\Method\RPC18methods\HMBmethod29may03.met
Sample ID : s21496
Vial : 14
Volume : 3
Acquired : 12/2/11 8:10:05 PM
Printed : 12/5/11 8:07:04 AM
File Desc. : MTI 1112-100-03 TSI 11080838



Det
166
Results

Pk #	Name	Retention Time	Area	Area Percent	Height	Height Percent	Width
1	DIOL	3.583	69545	3.4	5373	4.4	0.53
2	HMB	4.167	1970074	96.6	116364	95.6	1.20
Totals			2039619	100.0	121737	100.0	

CAHMB PRODUCTION LOT APPROVAL-Form C

Metabolic Technologies Inc.
2711 S. Loop Dr. Suite 4400
Ames, IA 50010

Date of Lot Production: 31 Oct 11 Initials: JAR Date: 8 Dec 11

Manufacturer: TST Health Sciences Initials: JAR Date: 8 Dec 11

Date Sample Received: 2 Dec 11 Initials: JAR Date: 8 Dec 11

MTI Sample Number: MTI 112-100-03 Initials: JAR Date: 8 Dec 11

Analyses Performed/Results

Analysis	Result (Pass/Fail)	Criteria	Date	Initials
HMB	Pass	HPLC	8 Dec 11	JAR
DHEA	Pass	GC/MS	8 Dec 11	JAR

Did This Lot Pass Analysis: yes Signature: [signature] Date: 8 Dec 11

If No Reason for Failure: _____ Initials: _____ Date: _____
If No Status of this Lot: _____ Initials: _____ Date: _____

WITNESS: [signature] **DATE:** 8 Dec 11

Quality Control Form C

Appendix D

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
51 L Avenue ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

JOHN A RATHMACHER
METABOLIC TECHNOLOGIES INC
IOWA STATE UNIVERSITY RESEARCH PARK
2711 S LOOP DRIVE SUITE 4400
AMES IA 50010-8656

Report Date: 20 Jan 2011
Work Order #: 27484
Account #: 001133

PO #: 10122

Date Received: 17 Dec 2010
Date Submitted: 15 Dec 2010
Temperature at Receipt: AMBIENT

CERTIFICATE OF ANALYSIS	As Received Result		Method Reference	Date Analyzed
10-M37924	**CALCIUM BETA-HYDROXY- BETA-METHYLBUTYRATE DIETARY SUPPLEMENT POWDER (MTI1012-100-03B) Lot #: 10111125**			
Aerobic Plate Count	< 10	CFU/gram	BAM 8th Ed	17 Dec 10
Coliform Count	< 10	CFU/gram	BAM 8th Ed	17 Dec 10
Escherichia coli USP	Negative		USP 32 NF 27	17 Dec 10
Weight for Escherichia coli USP	10	grams		17 Dec 10
Staphylococcus aureus	< 10	CFU/gram	BAM 8th Ed	17 Dec 10
Mold Count	10	CFU/gram	BAM 8th Ed	17 Dec 10
Yeast Count	< 10	CFU/gram	BAM 8th Ed	17 Dec 10
Salmonella (VIDAS)	Negative		AOAC/BAM Method 2004.03	17 Dec 10
Weight for Salmonella	100	grams		17 Dec 10
Listeria (VIDAS)	Negative		AOAC/BAM Method 2004.06	17 Dec 10
Weight for Listeria	25	grams		17 Dec 10
Moisture, Karl Fischer	7.71	%	KarlFisch	28 Dec 10
	Rerun 7.97% 10 Jan 11			
Copper	0.247	mg/Kg	SW-846 6010	4 Jan 11
Zinc	< 0.495	mg/Kg	SW-846 6010	4 Jan 11
Calcium	12.59	%	AOAC 985.01	6 Jan 11
	Retest = 13.17%			
Mercury	< 0.03	mg/Kg	SW846-7473	28 Dec 10
Arsenic	0.079	mg/Kg	SW-846 6020	28 Dec 10
Cadmium	0.006	mg/Kg	SW-846 6020	28 Dec 10
Lead	< 0.024	mg/Kg	SW-846 6020	28 Dec 10

AMENDED REPORT 11 JAN 11

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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CERTIFICATE OF ANALYSIS	As Received Result		Method Reference	Date Analyzed

(continued for sample 10-M37924)

CFU = Colony Forming Units

Approved by: R. Dan O'Connell

Dan O'Connell, Asst. Chemistry Lab Manager New Ulm, MN

Jesse L Portner

Jesse L Portner, Microbiology Lab Manager New Ulm, MN

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METABOLIC TECHNOLOGIES INC
IOWA STATE UNIVERSITY RESEARCH PARK
2711 S LOOP DRIVE SUITE 4400
AMES IA 50010-8656

Report Date: 19 Dec 2011
Work Order #: 28037
Account #: 001133

PO #: 11170

Date Received: 6 Dec 2011
Date Submitted: 2 Dec 2011
Temperature at Receipt: AMBIENT

CERTIFICATE OF ANALYSIS	As Received Result		Method Reference	Date Analyzed
11-M150535 11080838 (MTI1112-100- 03B) 2 DEC 11 ITEM# HMB001 1 KG SAMPLE				
Aerobic Plate Count	20	CFU/gram	BAM 8th Ed	6 Dec 11
Coliform Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Escherichia coli USP	Negative		USP 32 NF 27	6 Dec 11
Weight for Escherichia coli USP	10	grams		6 Dec 11
Staphylococcus aureus	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Mold Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Yeast Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Salmonella (VIDAS)	Negative		AOAC/BAM Method 2004.03	6 Dec 11
Weight for Salmonella	100	grams		6 Dec 11
Listeria (VIDAS)	Negative		AOAC/BAM Method 2004.06	6 Dec 11
Weight for Listeria	25	grams		6 Dec 11
Moisture, Karl Fischer	6.25	%	KarlFisch	8 Dec 11
Copper	0.360	mg/Kg	SW-846 6010	15 Dec 11
Zinc	0.780	mg/Kg	SW-846 6010	15 Dec 11
Calcium	12.36	%	AOAC 985.01	16 Dec 11
Mercury	< 0.03	mg/Kg	SW846-7473	9 Dec 11
Arsenic	< 0.122	mg/Kg	SW-846 6020	15 Dec 11
Cadmium	< 0.024	mg/Kg	SW-846 6020	15 Dec 11
Lead	< 0.122	mg/Kg	SW-846 6020	15 Dec 11

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Report Date: 19 Dec 2011
Work Order #: 28037
Account #: 001133

PO #: 11170

Date Received: 6 Dec 2011
Date Submitted: 2 Dec 2011
Temperature at Receipt: AMBIENT

CERTIFICATE OF ANALYSIS	As Received Result		Method Reference	Date Analyzed
11-M150536 11080837 (MTI1112-10- 02B) 2 DEC 11 ITEM# HMB001 1 KG SAMPLE				
Aerobic Plate Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Coliform Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Escherichia coli USP	Negative		USP 32 NF 27	6 Dec 11
Weight for Escherichia coli USP	10	grams		6 Dec 11
Staphylococcus aureus	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Mold Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Yeast Count	< 10	CFU/gram	BAM 8th Ed	6 Dec 11
Salmonella (VIDAS)	Negative		AOAC/BAM Method 2004.03	6 Dec 11
Weight for Salmonella	100	grams		6 Dec 11
Listeria (VIDAS)	Negative		AOAC/BAM Method 2004.06	6 Dec 11
Weight for Listeria	25	grams		6 Dec 11
Moisture, Karl Fischer	5.22	%	KarlFisch	8 Dec 11
Copper	0.380	mg/Kg	SW-846 6010	15 Dec 11
Zinc	0.340	mg/Kg	SW-846 6010	15 Dec 11
Calcium	12.03	%	AOAC 985.01	16 Dec 11
Mercury	< 0.03	mg/Kg	SW846-7473	9 Dec 11
Arsenic	< 0.122	mg/Kg	SW-846 6020	15 Dec 11
Cadmium	< 0.024	mg/Kg	SW-846 6020	15 Dec 11
Lead	< 0.122	mg/Kg	SW-846 6020	15 Dec 11

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CERTIFICATE OF ANALYSIS	As Received Result		Method Reference	Date Analyzed

(continued for sample 11-M150536)

CFU = Colony Forming Units

Approved by: R. Dan O'Connell

Dan O'Connell, Chemistry Lab Manager New Ulm, MN

Jesse L Portner

Jesse L Portner, Microbiology Lab Manager New Ulm, MN