



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

CERTIFICATE OF ANALYSIS

Calcium 3-Hydroxy 3-Methyl Butyrate(HMB), Monohydrate

Item No.	HMB001	Mfg Date	Feb.27,2016
Lot No.	16020042	Retest Date	Feb.26,2019

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT 0.55 g/ml	0.59g/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%	102.1%
	HMB	HPLC	77.0-82.0%	81.8%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	Negative
	Calcium (Ca ²⁺)	Titration	13.0-15.0%	13.5%
	Acetate	HPLC	NMT 1%	0.3%
	Moisture	USP<921 I>	5.0-7.5%	5.2%
	Arsenic (As)	AA/ICP	NMT 1.00 ppm	<0.20ppm
Lead (Pb)	AA/ICP	NMT 1.00 ppm	<0.20ppm	
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	<10 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	10 cfu/g
	<i>E. coli</i>	USP<62>	Negative	Negative
	<i>Salmonella</i>	USP<62>	Negative	Negative

Prepared by Jianfei Su

Approved by Liza M
QC Manager
Jiangyin TSI Pharmaceutical Co., Ltd.

Date Mar. 07, 2016

Chloe Chen
QA Manager
Jiangyin TSI Pharmaceutical Co., Ltd.

Date Mar. 07, 2016

Manufactured by TSI (China), Co. Ltd. Shanghai, CHINA

John C. Fuller Jr. Date: 24 MAR - 16
John C. Fuller, Jr., PhD Research Scientist, Metabolic Technologies, Inc.

ph 515 296.9916
fx 515 296.0908



2711 S. Loop Dr. Suite 4400
Ames, Iowa 50010

Results Report

Date: 04/22/2016

Work Order: RE160314-005

Client: TSI
Bldg 54, No 1089, Qinzhou Rd

Client Contact:

Comments:

Sample Tracking No.:

Sample Num: 6002601

Client Sample ID: 16020042

Sample Comment:

Lot No.:

Sample Date:

Sample Type: HMB

<u>Test</u>	<u>Result Name</u>	<u>Result</u>	<u>Unit</u>
Dehydroepiandrosterone via GCMS	Dehydroepiandrosterone	0.0	ng/g
beta-hydroxy-beta-methylbutyrate via HPLC	beta-hydroxy-beta-methylbutyric acid	80.9	%
Residual Solvents via GCMS	Ethanol	1.3	%
Residual Solvents via GCMS	Acetone	0.0	%
Residual Solvents via GCMS	2-Propanol	0.0	%
Residual Solvents via GCMS	Ethyl Acetate	0.0	%
Residual Solvents via GCMS	1,4 Dioxane	0.0	%

Technical Supervisor:

Date:

28 APR 16



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Ames, Iowa 50010

CERTIFICATE OF ANALYSIS

Calcium 3-Hydroxy 3-Methyl Butyrate(HMB), Monohydrate

Item No.	HMB001	Mfg Date	Mar.10,2016
Lot No.	16030056	Retest Date	Mar.09,2019

	Item	Method	Specification	Results
Physical Properties	Appearance	Visual	White powder	Complies
	Bulk Density	Loose Fill	NLT 0.55 g/ml	0.65g/ml
	Tap Density	Van Kel	NMT 0.90 g/ml	0.79g/ml
	Particle Size	Ro Tap	100% through USS#20 (850 micron)	100%
Analytical	CaHMB	HPLC	98.0-103.0%	101.4%
	HMB	HPLC	77.0-82.0%	81.2%
	Dimethylacrylic acid	HPLC	NMT 150 ppm	5ppm
	Calcium (Ca ²⁺)	Titration	13.0-15.0%	13.6%
	Acetate	HPLC	NMT 1%	0.2%
	Moisture	USP<921 I>	5.0-7.5%	5.6%
	Arsenic (As)	AA/ICP	NMT 1.00 ppm	<0.20ppm
	Lead (Pb)	AA/ICP	NMT 1.00 ppm	<0.20ppm
Microbial	Total Aerobic	USP<61>	NMT 1,000 cfu/g	25 cfu/g
	Yeast & Mold	USP<61>	NMT 100 cfu/g	20 cfu/g
	<i>E. coli</i>	USP<62>	Negative	Negative
	<i>Salmonella</i>	USP<62>	Negative	Negative

Prepared by Shan Liu

Approved by Liza M
QC Manager
Jiangyin TSI Pharmaceutical Co., Ltd.

Date Mar. 17, 2016

Jianwei Su
QA Manager
Jiangyin TSI Pharmaceutical Co., Ltd.

Date Mar. 17, 2016

Manufactured by TSI (China), Co. Ltd. Shanghai, CHINA

John C. Fuller Jr. Date: 24-Mar-16
John C. Fuller, Jr., PhD Research Scientist, Metabolic Technologies, Inc.

ph 515 296.9916
fx 515 296.0908



Results Report

2711 S. Loop Dr. Suite 4400
Ames, Iowa 50010

Date: 04/22/2016

Work Order: RE160321-006

Client: TSI
Bldg 54, No 1089, Qinzhou Rd

Client Contact:

Comments:

Sample Tracking No.:

Sample Num: 6002837

Lot No.:

Client Sample ID: CaHMB - Lot #: 16030056

Sample Date:

Sample Comment:

Sample Type: HMB

<u>Test</u>	<u>Result Name</u>	<u>Result</u>	<u>Unit</u>
Dehydroepiandrosterone via GCMS	Dehydroepiandrosterone	0.0	ng/g
beta-hydroxy-beta-methylbutyrate via HPLC	beta-hydroxy-beta-methylbutyric acid	80.2	%
Residual Solvents via GCMS	Ethanol	1.1	%
Residual Solvents via GCMS	Acetone	0.0	%
Residual Solvents via GCMS	2-Propanol	0.0	%
Residual Solvents via GCMS	Ethyl Acetate	0.0	%
Residual Solvents via GCMS	1,4 Dioxane	0.0	%

Technical Supervisor:

Date:

29 APR 16