

Volume 6 Suppl 1, 2009

Meeting abstracts

Proceedings of the Sixth International Society of Sports Nutrition (ISSN) Conference and Expo

New Orleans, LA, USA

14–15 June 2009

Published: 31 July 2009

These abstracts are available online at <http://www.jissn.com/supplements/6/S1>

POSTER PRESENTATIONS

P1

Consuming a supplement containing branched-chain amino acids during a resistance-training program increases lean mass, muscle strength and fat loss

Jim Stoppani¹, Timothy Scheett², James Pena¹, Chuck Rudolph³ and Derek Charlebois³

¹Weider Research Group, Woodland Hills, CA, USA

²College of Charleston, Charleston, SC, USA

³Ekawa Performance Training, Huntington Beach, CA, USA

E-mail: jstoppani@weiderpub.com

Journal of the International Society of Sports Nutrition 2009,

6(Suppl 1):P1

Background: A randomized, double-blind study was performed to evaluate the efficacy of consuming a supplement containing branched-chain amino acids (BCAAs) during an eight-week resistance-training program.

Methods: Thirty-six strength-trained males with a minimum of two years resistance-training experience (25.5 yrs, 177.7 cm, 85.2 kg and 9.3% body fat) were randomly assigned to receive either 14 grams of BCAAs (n = 12), 28 grams of whey protein (n = 12), or 28 grams of carbohydrates from a sports drink (n = 12) while performing an eight-week resistance-training program. Participants followed a periodized, whole-body training program that involved training all major muscle groups once per week using a four-day training split. Subjects body weight, body composition, and 10-rep max on the bench press and squat were determined before and after the eight-week training program. Subjects followed a standardized diet while following the program.

Results: All groups had a 100% compliance with the study protocol. The BCAA group experienced a significantly greater gain in body weight than the whey group (2 ± 1 kg vs. 1 ± 1 kg; $p < 0.02$) and the carbohydrate group (2 ± 1 kg vs. 1 ± 1 kg; $p < 0.01$). For lean mass, the BCAA group gained significantly greater lean mass than the whey group (4 ± 1 kg vs. 2 ± 1 kg; $p < 0.01$) and the carbohydrate group (4 ± 1 kg vs. 1 ± 1 kg; $p < 0.01$). The whey group also gained significantly more lean mass than the carbohydrate group (2 ± 1 kg vs. 1 ± 1 kg; $p < 0.02$). BCAA group decreased their percent body fat significantly more than the whey group ($2 \pm 1\%$ vs. $1 \pm 1\%$; $p = 0.039$) and the carbohydrate group ($2 \pm 1\%$ vs. $1 \pm 1\%$;

$p < 0.01$). Muscular strength was significantly greater in the BCAA group on the 10-RM bench press than the whey group (6 ± 3 kg vs. 3 ± 2 kg; $p < 0.01$) and the carbohydrate group (6 ± 3 kg vs. 2 ± 2 kg; $p < 0.01$). For the squat, the BCAA group gained significantly more strength on their 10-RM than the whey group (11 ± 5 kg vs. 5 ± 3 kg; $p < 0.01$) and the carbohydrate group (11 ± 5 kg vs. 3 ± 2 kg; $p < 0.01$).

Conclusion: Ingestion of a supplement containing BCAAs while following an 8-week resistance training program resulted in a greater decrease in percent body fat, an increase in lean mass, and 10-RM strength gains on the bench press and squat vs. ingestion of a whey supplement or a sports drink. In addition, the ingestion of a whey protein supplement resulted in greater lean mass gains than ingestion of a sports drink.

Acknowledgements

The authors would like to thank Scivation, Inc., Graham, NC, for funding this research.

P2

Effects of beta-alanine supplementation on performance and body composition in collegiate wrestlers and football players

Benjamin Kern and Tracey Robinson

Department of Human Performance and Physical Education, Adams State College, Alamosa, Colorado, USA

E-mail: Joni.kern@gmail.com

Journal of the International Society of Sports Nutrition 2009,

6(Suppl 1):P2

Background: Supplementation with β -alanine has been associated with improved strength, anaerobic endurance, body composition and performance on tests of anaerobic power output following varying training protocols, including high intensity interval training (HIIT) and heavy resistance training. Early season training for collegiate wrestling includes repeated bouts of high intensity exercise with intermittent rest periods; this type of training parallels HIIT from a metabolic standpoint. Collegiate wrestlers also use moderate to high intensity resistance training with high work to rest ratios. In-season football training includes repeated bouts of short sprints and Olympic/power lifting with low work to rest ratios.

Methods: Twenty-two Division II college wrestlers (19.9 ± 1.9 yr, age \pm SD) and 15 football players (18.6 ± 1.5 yr) completed this double-blind, placebo controlled study. Each subject ingested

Table 1 (abstract P2)

Test	Football Placebo (n = 8) Mean (SD)	Football Supplement (n = 7) Mean (SD)	Wrestling Placebo (n = 12) Mean (SD)	Wrestling Supplement (n = 10) Mean (SD)
Δ bodyweight	2.8 (1.2)	2.6 (1.9)	-3.2 (4.9)	-0.43 (4.6)
Δ bodyfat%	0.88 (1.5)	0.1 (1.1)	-1.1 (1.4)	-0.89 (0.66)
Δ lean mass	1.1 (2.3)	2.1 (3.6)	-0.98 (2.6)	1.1 (4.3)
Δ 300 shuttle	-0.4 (2.2)	-1.1 (0.94)	-1.3 (1.7)	-1.6 (2.2)
Δ 90° FAH	0.39 (6.5)	3.0 (5.4)	5.0 (3.9)	6.5 (7.3)
Δ Lactate	1.5 (3.3)	0.03 (3.7)	-2.3 (4.7)	-2.6 (4.7)

either 4 g/day β-alanine or placebo in powdered capsule form. Subjects were tested pre and post 8-week treatment in timed 300 yd. shuttle, 90° flexed arm hang (FAH), body composition, and blood lactate accumulation during 300 yd. shuttle. Wrestlers participated in 5 days per week training that included HIIT 3 days/week and resistance training with high work: rest ratios 2 days/week. Football players participated in 5 days/week training that included repeated sprints with low work: rest ratios 3 times/week and Olympic/power lifting 4 times/week.

Results: The subjects taking β-alanine achieved more desirable results on all tests compared to placebo (NS, $p > 0.05$). Performance improvements were greatest in the football supplement group, decreasing 300 shuttle time by 1.1 sec (vs. 0.4 sec. placebo) and increasing FAH (3.0 vs. 0.39 sec.). The wrestlers, both placebo and supplement lost weight (as was the goal, i.e. weight bracket allowance); however, the supplement group increased lean mass by 1.1 lb., while the placebo group lost lean mass (-0.98 lb). Both football groups gained weight; however, the supplement group gained an average 2.1 lb lean mass compared to 1.1 lb for placebo. See Table 1.

Conclusion: Supplementation with beta-alanine appears to have the ability to augment performance and stimulate lean mass accrual in a short amount of time (8 weeks) in previously trained athletes. β-alanine may magnify the expected performance outcomes of training programs with different metabolic demands.

Acknowledgements

The products were donated by Athletic Edge Nutrition. No other funding was received. The authors declare that they have no competing interests.

P3

Effect of eicosapentaenoic and docosahexaenoic acid on resting and exercise-induced inflammation and oxidative stress

Richard Bloomer, Douglas Larson, Andrew Galpin, Kelsey Fisher-Wellman and Brian Schilling
Cardiorespiratory/Metabolic Laboratory, Department of Health and Sport Sciences, The University of Memphis, Memphis, TN 38152, USA
E-mail: rbloomer@memphis.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P3

Background: The fish oils eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been reported to provide antioxidant and anti-inflammatory benefits at rest. The purpose of this study was to determine the effects of EPA/DHA supplementation on resting and exercise-induced inflammation and oxidative stress in trained men.

Methods: 14 men (26 ± 5 yrs) supplemented with 2224 mg EPA (MorEPA Mini; Minami Nutrition, Belgium) +2208 mg DHA (MorDHA Mini; Minami Nutrition, Belgium) and a placebo for 6 weeks using a random order, double blind cross-over design (with an 8 week washout period) prior to performing a 60 minute treadmill climb using a weighted backpack. Blood was collected before and at 0, 0.5, 24, and 48 hours post exercise and analyzed for C-reactive protein (CRP), tumor necrosis factor-alpha (TNF-α), protein carbonyls (PC), oxidized low density lipoprotein (oxLDL), malondialdehyde (MDA), hydrogen peroxide (H₂O₂), and xanthine oxidase activity (XO). Pre (wk 0) and post (wk 6) blood samples were analyzed for EPA and DHA content.

Results: Treatment with EPA/DHA resulted in a significant increase in blood levels of both EPA ($18 \pm 2 \mu\text{mol} \cdot \text{L}^{-1}$ vs. $143 \pm 23 \mu\text{mol} \cdot \text{L}^{-1}$; $p < 0.0001$) and DHA ($67 \pm 4 \mu\text{mol} \cdot \text{L}^{-1}$ vs. $157 \pm 13 \mu\text{mol} \cdot \text{L}^{-1}$; $p < 0.0001$), while no differences were noted for placebo. Resting levels of CRP and TNF-α were lower with EPA/DHA compared to placebo ($p < 0.05$). Resting oxidative stress markers were not different ($p > 0.05$). There was a mild increase in oxidative stress in response to exercise ($p < 0.05$), however no interaction effects or condition effects were noted. A condition effect was noted for CRP and TNF-α, with lower values with the EPA/DHA condition ($p < 0.05$). However, no interaction or time effects were noted ($p > 0.05$).

Conclusion: EPA/DHA supplementation increases blood levels of these fatty acids and results in decreased resting levels of inflammatory biomarkers in trained men, but does not appear necessary for exercise-induced attenuation in either inflammation or oxidative stress in this population. This may be due to the finding that trained men exhibit a minimal increase in inflammation and oxidative stress in response to moderate duration (60 minute), non-eccentric biased exercise.

Acknowledgements

This work was supported in part by Minami Nutrition, Belgium.

P4

Acute effects of VPX Meltdown® on plasma catecholamines, free fatty acids, glycerol, metabolic rate, and hemodynamics in young men and women

Richard Bloomer, Brian Schilling, Robert Canale, Megan Blankenship, Kelley Hammond and Kelsey Fisher-Wellman
Cardiorespiratory/Metabolic Laboratory, Department of Health and Sport Sciences, The University of Memphis, Memphis, TN 38152, USA
E-mail: rbloomer@memphis.edu

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P4

Background: We have recently reported that the dietary supplement Meltdown[®] (Vital Pharmaceuticals) increases plasma norepinephrine (NE), epinephrine (EPI), glycerol, and free fatty acids (FFA), as well as metabolic rate in healthy men [1]. However, in that investigation measurements ceased at 90 minutes post ingestion, with values for bloodborne variables peaking at this time. It was the purpose of the present investigation to extend the time course of post ingestion measurement to 6 hours.

Methods: Ten exercise trained men (age = 24 ± 4 yrs; BMI = 25 ± 3 kg · m⁻²; body fat = 9 ± 3%; mean ± SD) and 10 exercise trained women (age = 22 ± 2 yrs; BMI = 23 ± 3 kg · m⁻²; body fat = 23 ± 5%; mean ± SD) ingested Meltdown[®] or a placebo, in a random order, double blind cross-over design, with one week separating conditions. Blood samples were collected before and at one hour intervals throughout the 6 hour protocol. Samples through the 3 hour post ingestion period were obtained in a fasted state and a standard meal was provided after the hour 3 collection. Blood samples were assayed for EPI, NE, glycerol, and FFA. Breath samples were collected at each time for measurement of metabolic rate and substrate utilization using indirect calorimetry. Area under the curve (AUC) was calculated for all variables. Heart rate and blood pressure were recorded at all collection times, and data were analyzed using a 2 (condition) × 7 (time) analysis of variance.

Results: AUC was greater for Meltdown[®] compared to placebo for EPI (367 ± 58 pg · mL⁻¹ · 6 hr⁻¹ vs. 183 ± 27 pg · mL⁻¹ · 6 hr⁻¹; p = 0.01), NE (2345 ± 205 pg · mL⁻¹ · 6 hr⁻¹ vs. 1659 ± 184 pg · mL⁻¹ · 6 hr⁻¹; p = 0.02), glycerol (79 ± 8 μg · mL⁻¹ · 6 hr⁻¹ vs. 59 ± 6 μg · mL⁻¹ · 6 hr⁻¹; p = 0.03), and FFA (2.46 ± 0.64 mmol · L⁻¹ · 6 hr⁻¹ vs. 1.57 ± 0.42 mmol · L⁻¹ · 6 hr⁻¹; p = 0.05). For all variables, values were highest between 1 and 3 hours post ingestion of Meltdown[®]. The AUC for kilocalorie expenditure was not statistically different (p = 0.12) for Meltdown[®] (449 ± 29 kcal · 6 hrs⁻¹) compared to placebo (392 ± 21 kcal · 6 hrs⁻¹), despite being 15% higher for Meltdown[®]. However, when only considering the AUC for kilocalorie expenditure from rest to hour 3 (prior to feeding), a difference was noted (p = 0.05) for Meltdown[®] (224 ± 14 kcal · 3 hrs⁻¹) compared to placebo (187 ± 10 kcal · 3 hrs⁻¹). No difference (p = 0.32) was noted in AUC for substrate utilization between Meltdown[®] (4.83 ± 0.09 · 6 hrs⁻¹) and placebo (5.04 ± 0.15 · 6 hrs⁻¹). A condition main effect was noted for both systolic and diastolic blood pressure (p < 0.0001), with values increasing from a resting 111 ± 2/69 ± 2 mmHg to a peak of 124 ± 2/75 ± 2 mmHg at hour 3 with Meltdown[®], while no change was noted for placebo. A condition main effect was noted for heart rate (p = 0.01), with values increasing from a resting 57 ± 2 bpm to a peak of 63 ± 2 bpm at hour 5 with Meltdown[®], while no change was noted for placebo.

Conclusion: Ingestion of Meltdown[®] results in an increase in catecholamine secretion, markers of lipolysis, and metabolic rate in young men and women. An increase in hemodynamic variables is also noted, likely due to the catecholamine response to treatment. Intervention studies should be undertaken to determine the impact of this dietary supplement on weight/fat loss, while monitoring hemodynamic variables to ensure safety of treatment.

Acknowledgements

This work was supported in part by Vital Pharmaceuticals, Davie, Florida, USA.

Reference

1. Bloomer RJ, Fisher-Wellman KH, Hammond KG, Schilling BK, Weber AA and Cole BJ: **Dietary supplement increases plasma norepinephrine, lipolysis, and metabolic rate in resistance trained men.** *J Int Soc Sports Nutr* 2009, **6**:4.

P5

Thermogenic effect of Meltdown RTD™ energy supplement in young healthy college women

Stefanie Rashti, Jay Hoffman, Jie Kang, Nicholas Ratamess and Avery Faigenbaum

Department of Health and Exercise Science, The College of New Jersey, Ewing, NJ 08628-0718, USA

E-mail: hoffmanj@tcnj.edu

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P5

Background: The purpose of this study was to examine the acute effects of a high-energy supplement (Meltdown RTD[®]) on resting oxygen consumption (VO₂), respiratory quotient (RQ), caloric expenditure (kcal), heart rate (HR), blood pressure (BP), and mood in healthy and physically active women.

Methods: Ten female subjects (20.4 ± 0.70 y; 166.9 ± 7.2 cm; 67.0 ± 7.0 kg; 29.6 ± 6.5% body fat) underwent two testing sessions administered in a randomized and double-blind fashion. During each session, subjects reported to the Human Performance Laboratory after at least 3-h post-absorptive state and were provided either 140 ml of the high-energy supplement (S; commercially marketed as Meltdown RTD[®]) or placebo (P). Subjects consumed two 70 ml doses of S or P, separated by 30 min. Subjects then rested in a semi-recumbent position for three hours. VO₂ and HR were determined every 5 min during the first 30 min and every 10 min during the next 150 min. BP was determined every 15 min during the first 30 min and every 30 min thereafter. The profile of mood states and questionnaire focusing on alertness, focus and fatigue was determined every 30 minutes. Area under the curve (AUC) analysis was computed for VO₂, whereas a 3 hour average and an average for each hour was calculated for RQ, kcal from carbohydrate, kcal from fat, total kcal, HR, BP, and mood states.

Results: AUC analysis revealed a significant 10.8% difference in VO₂ between S and P for the 3 hour study period. No significant differences in oxygen consumption were seen in the first hour following ingestion of the supplement. Oxygen consumption was significantly elevated within the second hour (13.9%) and third hour (11.9%) following ingestion. A significant difference in energy expenditure was also seen between S (1.09 ± 0.10 kcal · min⁻¹) and P (0.99 ± 0.09 kcal · min⁻¹) for the 3 hour study period. Although energy expenditure was not significantly differently different between S and P in the first hour, significant differences between the groups were seen in the second (1.10 ± 0.11 kcal · min⁻¹ and 0.99 ± 0.09 kcal · min⁻¹, respectively), and third hour (1.08 ± 0.11 kcal · min⁻¹ and 0.99 ± 0.09 kcal · min⁻¹, respectively). Significantly higher systolic BP (p < 0.01) was observed between S (110.0 ± 3.9 mmHg) and P (107.3 ± 4.4 mmHg) during the three hour study period. No significant differences were seen in HR or diastolic BP at

any time point. No significant differences were seen between S and P in any of the mood states measured during the study.

Conclusion: Results indicated a significant increase in energy expenditure in young, healthy women following an acute ingestion of a high-energy supplement. In addition, ingestion of this supplement increases in systolic blood pressure for three hours following ingestion; however, blood pressure values were well within the normal range.

Acknowledgements

This study was funded by Vital Pharmaceuticals, Inc., Davie, Florida.

P6

The effect of ingesting a caffeine-enhanced sport drink on resting energy expenditures and blood pressure in females

Brian Klepacki, B Sue Graves and Peter Hellberg
Department of Exercise Science and Health Promotion,
Florida Atlantic University, 777 Glades Road, Boca Raton,
Florida 33431, USA
E-mail: bklepacki@gmail.com

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P6

Background: The effects of caffeine-enhanced drinks on resting energy expenditure and blood pressure have not been studied extensively in recreationally active females. The purpose of this study was to evaluate the effects of a thermogenic supplement, Redline Princess, on resting energy expenditure, resting blood pressure, and resting heart rate. In addition, the effect of the pre-exercise drink on subjective feelings of fatigue and vigor was also explored.

Methods: Six recreationally active females (age 24.50 ± 2.17 years; height, 162.56 ± 8.27 cm; weight 55.80 ± 7.44 kg), who were apparently healthy and recreationally active individuals, reported to the Resting Metabolic Laboratory for two separate testing sessions to participate in a randomized, double-blind crossover design. While in a fasted state, the participants were provided with either 240 ml of a caffeine-enhanced sport drink, Redline Princess (SUP), or 240 ml of a placebo (PL). Resting energy expenditure (REE), resting blood pressure (RBP), and resting heart rate (RHR) were assessed at 1-hour, 2-hour, and 3-hours post ingestion. A Profile of Moods State (POMS) questionnaire was completed each hour to assess fatigue and vigor. A two-day wash-out period was required between sessions. Data were analyzed by two-factor (group \times time) ANOVA using SAS version 9.1.3.

Results: The Redline Princess supplementation did result in a significant increase ($p = 0.045$) in REE when compared to the placebo at 60 minutes: ($1.07 \pm .15$ vs. $.96 \pm .20$ kcal/min), 120 minutes ($1.02 \pm .16$ vs. $.94 \pm .19$ kcal/min), and at 180 minutes ($1.03 \pm .15$ vs. $.95 \pm .20$ kcal/min) post-ingestion. No significant differences were observed for BP, HR, fatigue or vigor ($p > 0.05$) for either group.

Conclusion: In this study, Redline Princess did have an acute significant impact on resting energy expenditure more than the placebo for several hours after ingestion in fully rested states.

Acknowledgements

The authors would like to thank Vital Pharmaceuticals, Inc. dba VPX/Redline Princess for supplying the product for the study.

P7

The anabolic hormone response to a lower-body resistance exercise bout in conjunction with oral BCAA supplementation

Bill Campbell¹, Paul La Bounty², Austin Oetken²,
Mike Greenwood², Richard Kreider³
and Darryn Willoughby²

¹University of South Florida – Exercise and Performance
Nutrition Laboratory, Tampa, FL, USA

²Baylor University – Exercise and Biochemical Nutrition
Laboratory, Waco, TX, USA

³Texas A&M University – Exercise and Sport Nutrition
Laboratory, College Station, TX, USA

E-mail: Campbell@coedu.usf.edu

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P7

Background: BCAAs (leucine, isoleucine, and valine), particularly leucine, activate key enzymes in protein synthesis after physical exercise. Research has demonstrated that BCAAs increase mTOR phosphorylation and activate p70 S6 kinase in human muscle via an Akt-independent pathway. The extent to which BCAAs influence the anabolic hormone response in conjunction with resistance exercise is not well established. A randomized, double-blind, placebo-controlled study was performed to evaluate the effects of BCAA ingestion in conjunction with an acute bout of lower-body resistance exercise (RE) on various anabolic hormones.

Methods: 20 recreationally active males ingested a BCAA supplement (120 mg/kg/bw) ($n = 10$; 24.4 years; 178.3 cm; 85.4 kg) or a placebo ($n = 10$; 21 years; 176.8 cm; 83 kg) at 3 time points: 30 minutes prior to RE, and immediately pre-RE and immediately post-RE. Subjects performed 4 sets of leg press and 4 sets of leg extension at 80% 1 RM to failure. Rest periods between sets and exercises was approximately 150 seconds. Venous blood was sampled at baseline; 30 min later, immediate postexercise, 30 min post-exercise; 2 hrs post-exercise, and 6 hrs post-exercise for serum insulin, growth hormone (GH), and free insulin-like growth factor-1 (IGF-1). A two-way ANOVA with repeated measures was utilized to analyze the data.

Results: Data are reported as means \pm SD at baseline; 30 min later, immediate postexercise, 30 min post-exercise; 2 hrs post-exercise, and 6 hrs post-exercise. Insulin values were 19.2 ± 7.8 , 23.0 ± 9.6 , 25.3 ± 12.9 , 24.8 ± 14.3 , 19.0 ± 9.0 , 15.8 ± 6.4 and 22.0 ± 10.5 , 22.0 ± 10.9 , 27.8 ± 9 , 24.1 ± 8.7 , 17.9 ± 8.8 , 21.2 ± 12.8 uIU/mL for the BCAA and Placebo groups, respectively. A significant main effect for time was observed ($p < .001$), but no significant main effect for group ($p = .758$) or significant interaction ($p = .465$) was observed for insulin. GH values were $.41 \pm .81$, $.64 \pm .97$, 1.9 ± 2.2 , 1.5 ± 2.6 , $.23 \pm .32$, 2.6 ± 4.0 and $.07 \pm .09$, $.84 \pm 1.3$, 2.2 ± 1.9 , 2.2 ± 3.8 , $.28 \pm .76$, $.36 \pm .56$ ng/ml for the BCAA and Placebo groups, respectively. A significant main effect for time was observed ($p = .021$), but no significant main effect for group ($p = .672$) or significant interaction ($p = .217$) was observed for GH. Free IGF-1 values were $1.3 \pm .83$, $1.2 \pm .72$, $1.2 \pm .77$, $1.4 \pm .91$, $1.1 \pm .74$, $.95 \pm .64$ and $1.3 \pm .43$, $1.2 \pm .43$, $1.6 \pm .54$, $1.5 \pm .57$, $1.4 \pm .46$, $1.1 \pm .53$ ng/ml for the BCAA and Placebo groups, respectively. A significant main effect for time was observed ($p = .014$), but no significant main effect for group

($p = .569$) or significant interaction ($p = .356$) was observed for free IGF-1.

Conclusion: An acute bout of lower-body RE significantly increases insulin, GH, and IGF-1 in the immediate post-exercise time period, but oral ingestion of BCAA at a dosage of 120 mg/kg/bw does not impart an additional effect of the hormonal response to the resistance exercise stimulus.

P8

A comparison of hyperimmune egg protein and placebo for efficacy and safety among healthy young adults

Timothy Scheett¹, Tyler Martin², Benjamin Carr³ and Michael Webster³

¹College of Charleston, Charleston, SC, USA

²Troy University, Troy, AL, USA

³The University of Southern Mississippi, Hattiesburg, MS, USA
E-mail: ScheettT@cofc.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P8

Background: A randomized, double-blind, placebo-controlled study was performed to evaluate the safety and efficacy of consuming an oral hyperimmune egg (HIE) protein supplement during a sample training program in healthy young adults.

Methods: Twenty-four recreationally active males (23.6 yrs, 176 cm, 69.2 kg and 17.1% body fat) were randomly assigned to either HIE ($n = 12$) or an egg protein placebo (PLA) group. Participants were supplemented with $4.5 \text{ g} \cdot \text{d}^{-1}$ for 2 d, $9 \text{ g} \cdot \text{d}^{-1}$ for 2 d and $13.5 \text{ g} \cdot \text{d}^{-1}$ for 6 d. HIE and PLA supplements were identical in appearance and taste before and after mixing with 237 mL of milk. Subjects recorded duration and severity of adverse events in a daily log.

Results: HIE and PLA had a 100% compliance with the study protocol. 17% ($n = 2$) of HIE and 25% ($n = 3$) of PLA reported experiencing at least one adverse event. HIE reported experiencing adverse events for a total of 10 d as compared to 24 d for PLA. In HIE one subject reported experiencing stomach ache and diarrhea for 3 d (severity of 2 on a 10 pt scale) and another subject reported a skin rash lasting 4 d (severity of 6 on a 10 pt scale). In PLA one subject reported experiencing stomach ache and vomiting for 3 d and increased thirst and feeling tired/sleepy for 3 d (severity of 7 and 8, respectively, on a 10 pt scale). Subjects reported a runny nose ($n = 3$) lasting 1–3 days (1–5 severity on a 10 pt scale) and a cough ($n = 2$) lasting 3 d (severity 1–5 on a 10 pt scale).

Conclusion: It was concluded that HIE ingestion was associated with fewer adverse events of similar or lesser severity than PLA. All adverse events experienced by the subjects were minimal and transitory in nature with none requiring medical intervention.

Acknowledgements

The authors would like to thank Legacy for Life, LLC, Melbourne, FL, for funding this research.

P9

Influence of bottled water on rehydration following a dehydrating bout of cycling exercise

Daniel Heil and John Seifert

Movement Science/Human Performance Laboratory,
Department of Health and Human Development, Montana
State University, Bozeman, MT 59717, USA

E-mail: dheil@montana.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P9

Background: The purpose of this study was to compare the ability of two types of bottled water to rehydrate cyclists following a dehydrating bout of cycling exercise. It was hypothesized that rehydration would occur faster and/or more completely following the consumption of bottled glacier water supplemented with Alka-PlexLiquid™ (experimental condition) as compared to a filtered bottled water (placebo condition).

Methods: Ten male cyclists (Mean \pm SD: 40 ± 5 years age, 51.3 ± 7.8 ml/kg/min maximal oxygen uptake) performed two trials (1-week apart) of stationary cycling in a warm room ($27.5\text{--}28.5^\circ\text{C}$, $\geq 50\%$ relative humidity) for 75–105 minutes at a power output that initially elicited 70–80% of maximal heart rate. Subjects exercised until dehydrating to -2.5% of pre-exercise nude body weight. Each cycling bout was followed immediately by the consumption of either the experimental (Akali; Glacier Water Company, LLC; Auburn, WA USA) or placebo (Aquafina; PepsiCo Inc., Purchase, NY USA) bottled waters (counter-balanced order, double-blind design) in a volume equivalent to body weight lost. Blood and urine samples, as well as nude body weight, were measured at fixed time points: Immediately pre- and post-exercise, and 30, 60, 90, 120, and 180 minutes post-exercise. Urine samples were analyzed for volume output and specific gravity, while changes in total serum protein were determined from the blood samples. Data were evaluated with paired t-tests and repeated measures ANOVA with planned contrasts at the 0.05 alpha level.

Results: Neither absolute (Mean \pm SE; -2.00 ± 0.05 and -1.95 ± 0.07 kg) nor relative (-2.6 ± 0.1 and $-2.5 \pm 0.1\%$) amounts of body mass lost differed between placebo and experimental dehydration ($P > 0.05$), respectively. Urine output was significantly higher at time points ≥ 60 minutes post ingestion: 103.5 ± 24.4 versus 58.4 ± 14.0 mls, 183.1 ± 33.1 versus 125.2 ± 33.4 mls, 198.7 ± 35.9 versus 97.7 ± 25.5 mls, 234.5 ± 53.0 versus 107.6 ± 21.6 mls, for 60, 90, 120, and 180-min post ingestion, respectively ($P < 0.05$). At the same time points, urine specific gravity tended to be higher for the experimental (1.014–1.012) than placebo water (1.005–1.008; $P = 0.02\text{--}0.08$). Lastly, serum protein tended to be less concentrated in the blood for the experimental water trial than for the placebo water trial at 120-minutes (7.7 ± 0.03 versus 6.7 ± 0.2 g/L; $P = 0.08$) and 180-minutes (7.8 ± 0.3 versus 6.7 ± 0.2 g/L; $P = 0.08$) post ingestion. Water retention at the end of the 3-hour recovery period, calculated as 1 minus the ratio of total urine volume (TUV) to ingested water volume (IWV) as a percentage ($[1 - (\text{TUV}/\text{IWV})] \times 100$), was significantly higher for the experimental water trial ($79.2 \pm 3.9\%$) than for the placebo water trial ($62.5 \pm 5.4\%$; $P < 0.05$).

Conclusion: Consumption of the experimental water resulted in significantly less urine output, a tendency for more water to be retained in the blood, and a higher overall water retention rate over the placebo water. Collectively, these results indicate that consumption of the experimental bottled water following a dehydrating bout of exercise provided faster and more complete rehydration to cyclists than the highly-filtered bottled water. It is likely that the Alka-PlexLiquid™ supplement, the high pH of 10.0, or some other unidentified component of the experimental water, was responsible for these observations.

Acknowledgements

This study was supported by the Glacier Water Company, LLC, Auburn, WA 98001.

P10

The effects of low-fat skim chocolate milk on urinary hydration indices in a sample of Division I-AA cross country runners during off-season training sessions

Jamie Ghigiarelli, Katie Sell, Michelle Blum, Nicholas Dagastino and Peter Alfano
Department of Physical Education and Sports Sciences,
Human Performance Lab, Hofstra University, Hempstead,
NY 11549, USA
E-mail: Jamie.Ghigiarelli@hofstra.edu

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P10

Background: A randomized cross over design study was performed to examine the effects of three different hydration drinks (water, W; gatorade, CHO-E; and low-fat skim chocolate milk, CHC) post exercise in a sample of Division I-AA cross country runners during off season practice sessions.

Methods: Urine samples were collected from nine cross country runners twice a week (on the intense interval training days each week) for six weeks pre and post practice sessions. Each week participants consumed one of the three rehydration drinks. Participants served as their own control and drink choice was randomized in a cross over design across the three drinks. Urine was tested at four different times on each of the experimental days; (1) before practice (PRE), (2) immediately after practice (IPE), (3) 60 minutes after practice (RECV), (4) and a midnight sample (PST). Four urine indexes were examined on each of the experimental days to assess the difference in hydration status using the three experimental drinks: 1) Urine osmolality¹ (U_{osm}), 2) specific gravity² (U_{sg}), 3) volume of urine output³ (U_o), and 4) urine color⁴ (U_{col}).

Results: Rehydration of low-fat skim chocolate milk post exercise exhibited a non-significant decrease ($p = .08$) of approximately 35% in urine volume output throughout the evening in the CHC group (346 ± 95 ml) when compared to CHO-E (476 ± 188 ml) and W (549 ± 240 ml) groups. Urine osmolality, specific gravity, and color scores gradually decreased across all drinks from 60 minute recovery to nightly urine samples with a more significant drop observed in the control (W) group ($p = .03^{osmo}$, $.01^{color}$). This indicates rehydration occurred after exercise using all the drinks however, it appears a slower rate of hydration occurred in the chocolate milk and CHO-E groups. A secondary finding was a significant correlation did exist between urine osmolality and urine specific gravity ($r = 0.83^*$), while weak non-significant correlations occurred between urine osmolality and color ($r = .557$) as well as urine specific gravity and color ($r = .367$).

Conclusion: The results of this study suggest that implementation of a nutrient dense drink (chocolate milk) post exercise will show a non-significant trend to reduce urine output. Due to its high macronutrient and electrolyte content chocolate milk may be a viable way to reduce urine output and increase water retention which may allow one to maintain a more euhydrated state post exercise. It is also concluded the indices of urine osmolality and urine specific gravity indicate a strong relationship

as markers of hydration status as opposed to urine color. This information could be applicable when using different modalities to assess hydration status.

Acknowledgements

The authors would like to thank the American Dairy Association and Dairy Council, Inc (ADADC) for the grant funding of this research project. In addition, we would also like to thank Matt Pikosky, Director of Research Transfer of Dairy Management Inc (Rosemont, IL) for his assistance in the experimental design of the manuscript.

P11

Effects of BIOCREAT supplementation on strength and body composition during an 8-week resistance training program

Morgan Lewing¹, Earnest Pena¹, Chris Poole¹, Fanny Dufour¹, Eric Consancio¹, Hallie Jacobson¹, Kristen Dugan¹, Tyler Jones¹, Natalie Ervin¹, Cliffa Foster¹, Richard Kreider², Lem Taylor¹ and Colin Wilborn¹
¹University of Mary Hardin-Baylor, Human Performance Lab, Belton, TX 76513, USA
²Texas A&M University, Exercise and Sport Nutrition Lab, College Station, TX, USA
E-mail: cwilborn@umhb.edu

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P11

Background: BIOCREAT is a highly purified unique molecule extracted from Fenugreek (*Trigonella Foenun greacum*) seeds. BIOCREAT is a proprietary patent pending molecule of INDUSBIOTECH that is hypothesized to enhance creatine uptake. The purpose of this study was to evaluate the effects of BIOCREAT supplementation on strength and body composition.

Methods: 47 Resistance trained men completed all phases of testing. Subjects were matched according to body weight and randomly assigned to ingest in a double blind manner 75 g of dextrose (N = 15, 20 ± 1.1 yrs, 177 ± 6 cm, 87 ± 11 kg, 16 ± 5.6 %BF), 75 g of dextrose/5 g creatine in powdered form (N = 14, 21 ± 4 yrs, 181 ± 7.1 cm, 89 ± 12 kg, 18 ± 5.5 %BF) or 900 mg BIOCREAT/3.5 g creatine capsules (N = 17, 21 ± 2 yrs, 179 ± 6 cm, 85 ± 10 kg, 15 ± 6 %BF). Subjects participated in a supervised 4-day per week periodized resistance-training program split into two upper and two lower extremity workouts per week for a total of 8-weeks. At 0, 4, and 8-weeks, subjects were tested on body composition via dual energy x-ray absorptiometry, 1 RM strength, muscular endurance, and anaerobic capacity. Statistical analyses utilized a two-way ANOVA with repeated measures for all criterion variables ($p \leq 0.05$). Data are presented as mean \pm SD changes from baseline values.

Results: Significant group \times time interaction effects ($p \leq .05$) were observed with BIOCREAT and creatine groups compared to placebo in changes of lean mass (PL: $.4 \pm 1.7$ kg, CRE: 1.8 ± 2.1 kg, BIO: 1.8 ± 1.3 kg) and bench press 1 RM (PL: 8 ± 10.7 lbs, CRE: 21 ± 13 lbs, BIO: 16 ± 11 lbs). Further analysis revealed that the BIO group had a significantly ($p \leq .05$) greater Wingate peak power (PL: 18.9 ± 55.7 watts, CRE: 12.1 ± 70.4 watts, BIO: 55.8 ± 66.1 watts) at the four week time point in comparison to PL and CRE. Significant main effects for time ($p \leq .05$) were observed on body weight, fat mass, body fat percentage, leg press, and Wingate mean power. No

significant interactions were observed among groups for muscular endurance on bench press or leg press or in any clinical safety data including lipid panel, liver function, kidney function, and/or CBC panel ($p > 0.05$).

Conclusion: It is concluded that BIOCREAT supplementation had a significant impact on upper body strength and body composition in comparison to placebo in a double blind controlled trial. The results obtained also demonstrated that there was no significant difference between BIOCREAT and the dextrose/creatine mixture on parameters of upper body strength and body composition. These changes were obtained with no clinical side effects. We conclude that in addition to a structured resistance training program, BIOCREAT can significantly increase strength and muscle mass.

Acknowledgements

This Study was sponsored by INDUS BIOTECH.

P12

Effects of TESTOSURGE supplementation on strength, body composition and hormonal profiles during an 8-week resistance training program

Chris Poole¹, Brandon Bushey¹, Earnest Pena¹, Eric Constancio¹, Tyler Jones¹, Fanny Dufour¹, Natalie Ervin¹, Brittany Clemens¹, Darryn Willoughby², Richard Kreider³, Cliffa Foster¹, Lem Taylor¹ and Colin Wilborn¹

¹University of Mary Hardin-Baylor, Human Performance Lab, Belton, TX 76513, USA

²Baylor University, Exercise and Biochemical Nutrition Lab, Waco, TX, USA

³Texas A&M University, Exercise and Sport Nutrition Lab, College Station, TX, USA

E-mail: cwilborn@umhb.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P12

Background: TESTOSURGE is a novel, proprietary substance extracted from Fenugreek (*Trigonella Foenun greacum*) seeds and is patent pending by INDUS BIOTECH. The purpose of this study was to determine the effects of TESTOSURGE supplementation on strength, body composition and hormonal profiles.

Methods: 30 resistance trained males completed all phases of the study. Subjects were matched according to total body weight and randomly assigned in a double-blind manner to ingest either 500 mg of a placebo ($N = 13$, 21 ± 3 yrs, 180 ± 6.4 cm, 84 ± 15 kg, 18.3 ± 6.8 BF%) or TESTOSURGE ($N = 17$, 21 ± 2.8 yrs, 178 ± 5.8 cm, 85 ± 9.6 kg, 18.8 ± 4.8 BF%) once per day for eight weeks. Subjects participated in a supervised, 4-day per week periodized resistance training program consisting of two upper extremity and two lower extremity workouts per week for a total of 8 weeks. At weeks 0, 4 and 8, hydrodensitometry body composition, 1 RM bench press and leg press, muscular endurance, anaerobic power and hormonal profiles were assessed. Statistical analyses utilized a two-way ANOVA with repeated measures for all criterion variables ($p \leq 0.05$). Data are presented as mean \pm SD changes from baseline values.

Results: Significant group \times time interaction effects occurred over the eight week period for body fat percentage (TES: $-1.77 \pm 1.52\%$, PL: $-0.55 \pm 1.72\%$; $p = 0.048$), total testosterone (TES: 0.97 ± 2.67 ng/ml, PL: -2.10 ± 3.75 ng/ml; $p = 0.018$)

and bioavailable testosterone (TES: 1.32 ± 3.45 ng/ml, PL: -1.69 ± 3.94 ng/ml; $p = 0.049$). A significant main effect for time ($p \leq 0.05$) was noted for bench press 1 RM, leg press 1 RM and lean body mass. No significant changes were detected among groups for Wingate peak or mean power, total body weight, free testosterone, dihydrotestosterone, estrogen, hemodynamic variables, or clinical safety data including lipid panel, liver function, kidney function, and/or CBC panel ($p > 0.05$).

Conclusion: It is concluded that 500 mg of daily TESTOSURGE supplementation significantly impacted body fat percentage, total testosterone and bioavailable testosterone when compared to a placebo in a double-blind fashion. These changes were attained without any clinical side effects. We conclude that combined with a structured resistance training program, TESTOSURGE can significantly improve body composition and increase the anabolic hormonal status in resistance trained males over an 8 week period.

Acknowledgements

This study was sponsored by INDUS BIOTECH.

P13

The effects of a starch based carbohydrate alone or in combination with whey protein on a subsequent bout of exercise performance – preliminary findings

Paul La Bounty¹, Matt Cooke¹, Bill Campbell², Josh Vanta¹, Haleigh Mistry¹, Mike Greenwood¹, Rafer Lutz¹ and Darryn Willoughby¹

¹Baylor University – Exercise and Biochemical Nutrition Laboratory, Waco, TX, USA

²University of South Florida – Exercise and Performance Nutrition Laboratory, Tampa, FL, USA

E-mail: Paul_La_Bounty@baylor.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P13

Background: High-molecular weight, starch based carbohydrates have been shown to leave the stomach faster as well as replenish muscle glycogen more rapidly as compared to lower molecular weight, monomeric glucose and short-chain glucose oligomers (Leiper, et al. 2000 and Piehl Aulin et al. 2000). Furthermore, it has been shown that Vitargo[®] (a high molecular weight, low osmolality starch based carbohydrate) led to a greater work-output during a 15 minute time-trial 2 hours following cycling to exhaustion when compared to maltodextrin (a low molecular weight carbohydrate) (Stephens et al. 2008). The purpose of this study was to replace a portion of a high-molecular weight carbohydrate with whey protein to determine if it could enhance muscle glycogen re-synthesis following a heavy resistance training bout and/or enhance a subsequent bout of exercise (15 min cycle ergometer time trial) 2 hours later.

Methods: 10 recreationally active, fasted males (21.5 years; 178.1 cm; 79.5 kg) performed 5 sets of hack squats, 5 sets of leg press, and 5 sets of leg extension at 80% of 1 RM to failure (in attempt to reduce muscle glycogen content). Rest periods between sets and exercises were 150 seconds. Immediately following the RT bout, participants were block-randomized to consume a 1 liter solution containing either 1.0 g/kg of carbohydrate from Vitargo[®] S2 or 0.75 g/kg of carbohydrate from Vitargo[®] S2 + 0.25 g/kg of a commercially available whey protein product (whey protein isolate, whey protein

concentrate, and whey protein hydrolysates). Both supplements were ~ isocaloric. Exactly one week later, the participants performed the same resistance training (RT) protocol, but consumed the second solution. After consuming the supplement, the subjects rested in a semi-supine position for 2 hours. Following the rest period, the participants performed a 15 minute time trial on a cycle ergometer. The time-trial was programmed in a pedaling dependent mode, in which an increase in pedaling rate increased the work rate. Total work (kJ) was recorded at 5, 10, and 15 minutes. A two-way (2×3 – supplement \times time) ANOVA with repeated measures was utilized to analyze the data using SPSS 16.0.

Results: Data are reported as means \pm SD at 5, 10, and 15 minutes during the time-trial. Total work was 53.4 ± 13.7 , 102.7 ± 27.4 , 150.8 ± 41.2 and 52.1 ± 13.6 , 100.8 ± 28.1 , 149.7 ± 42.5 for the Vitargo[®] S2 and Vitargo[®] S2 + whey protein groups, respectively. A significant main effect for time was observed ($p < 0.001$), but no significant main effect for treatment ($p = .550$) or significant treatment \times time interaction ($p = 0.798$) was observed for total work (kJ).

Conclusion: Consuming 0.75 g/kg of carbohydrate from Vitargo[®] S2 + 0.25 g/kg of whey protein does not enhance a subsequent bout of exercise performance above that observed when 1 g/kg of carbohydrate from Vitargo[®] S2 alone was consumed.

Acknowledgements

This study was supported by funds from the Baylor University Research Committee and the Vice Provost for Research.

P14

The effects of an acute dose of *Rhodiola rosea* on exercise performance and cognitive function

Eric Noreen, James Buckley and Stephanie Lewis
The Department of Health Sciences, Gettysburg College,
Gettysburg, PA 17325, USA

E-mail: enoreen@gettysburg.edu

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P14

Background: The purpose of this study was to determine the effects of an acute oral dose of 3 mg/kg of *Rhodiola rosea* (*R. rosea*) on endurance exercise performance, mood, and cognitive function.

Methods: A total of 15 recreationally active college women (21.3 ± 0.09 y, 56.1 ± 6.3 kg; mean \pm SD) participated in this study. 2–7 d after a familiarization trial subjects ingested in a double blind, random crossover manner, either *R. rosea* or a carbohydrate placebo 1 h prior to testing. Exercise testing consisted of a 10 minute warm-up, standardized to 80% of the average watts produced during the familiarization trial, followed by a 6 mile simulated indoor time trial on a Velotron electronic bicycle ergometer. Every 5 min during the time trial, subjects rated their level of perceived exertion using a BORG 10 pt scale. A blood sample was taken pre warm-up, 2 minutes post warm-up, and 2 minutes following completion of the time trial, and was analyzed for lactate concentration. Subjects also completed a Profile of Mood States (POMS) questionnaire and a Stroop's color test pre-warm up and following the completion of the time trial. Subjects returned to the lab 2–7 d later to repeat the testing with the other condition.

Results: A 3 mg/kg acute dose of *R. rosea* resulted in a shorter time to completion of the 6 mile time trial course (*R. rosea*

1544.7 ± 155.2 s, Placebo 1569.5 ± 179.4 s; mean \pm SD; $p = 0.06$) as well as a lower average heart rate during the standardized warm up (*R. rosea* 138.6 ± 13.3 bpm, Placebo 143.7 ± 12.4 bpm; mean \pm SD; $p = 0.001$). There were no significant differences between treatment conditions for rating of perceived exertion during the time trial. Both treatments resulted in a significant increase in the POMS fatigue score following exercise ($p = 0.001$), as well as a significant improvement following exercise for the Stroop's test of incongruent words ($p = 0.001$). No other significant differences between treatments were observed.

Conclusion: Acute *Rhodiola rosea* ingestion decreases the heart rate response to sub-maximal exercise, and appears to improve endurance exercise performance.

P15

Effects of different carbohydrates and protein recovery mixtures on exogenous and endogenous substrate oxidation during subsequent exercise

Eva Warrick, Roderick King and John O'Hara
Leeds Metropolitan University, Leeds, UK
E-mail: E.Detko@leedsmet.ac.uk

Journal of the International Society of Sports Nutrition 2009,
6(Suppl 1):P15

Background: A randomized, double-blind, placebo-controlled study was performed to evaluate the effect of adding protein (PRO) to a recovery mixture on exogenous and endogenous substrate oxidation during post-recovery exercise. Many studies have shown that carbohydrates (CHO) effectively restore glycogen post-exercise [1]. Some have also suggested that the addition of PRO to a CHO drink may produce further improvements [2]. CHO and PRO ingestion during recovery may result in higher CHO oxidation during subsequent exercise, which may be more beneficial to endurance performance because of preservation of endogenous substrates [3].

Methods: With institutional ethics approval six well-conditioned men [age: 34.0 yrs \pm 8.2; body mass (BM): 75.6 kg \pm 7.1; max: 62.5 ml \cdot kg BM⁻¹ \cdot min⁻¹ \pm 6.5] completed a depletion protocol, followed by a 4-hour recovery period, and a subsequent 60 min cycle at 65% max on 3 occasions. During recovery subjects ingested either a placebo (PL), MD+¹³C-GAL+PRO (highly naturally enriched maltodextrin, ¹³C-labelled galactose, whey protein hydrolysate, L-leucine, L-phenylalanine; $0.5 + 0.3 + 0.2 + 0.1 + 0.1$ g \cdot kg BM⁻¹ \cdot h⁻¹) or MD+¹³C-GAL ($0.9 + 0.3$ g \cdot kg BM⁻¹ \cdot h⁻¹) drink. O₂ consumption (L/min) and CO₂ production (L/min) were analyzed using breath-by-breath methodology (Metalyzer 3B, Cortex, Leipzig, Germany). Samples of expired air for determination of the ¹³C enrichment were collected every 15 min of the post-ingestion exercise. Data expressed as means \pm s. Statistical significance set at $p \leq 0.05$.

Results: The mean rate of exogenous CHO oxidation (g \cdot min⁻¹) after MD+¹³C-GAL vs. MD+¹³C-GAL+PRO was: 1.80 ± 0.26 vs. 1.60 ± 0.18 (at 15 min), 1.85 ± 0.17 vs. 1.61 ± 0.17 (at 30 min), 1.88 ± 0.13 vs. 1.59 ± 0.20 (at 45 min), and 1.81 ± 0.12 vs. 1.47 ± 0.22 (at 60 min), respectively. The mean rate of endogenous CHO oxidation (g \cdot min⁻¹) after MD+¹³C-GAL vs. MD+¹³C-GAL+PRO was: 1.33 ± 0.21 vs. 1.66 ± 0.31 (at 15 min), 0.95 ± 0.31 vs. 1.27 ± 0.40 (at 30 min), 0.72 ± 0.25 vs. 1.47 ± 0.20 (at 45 min), and 0.78 ± 0.26 vs. 1.64 ± 0.22 (at 60 min), respectively. Differences between

conditions were statistically significant at 45 and 60 min ($p < 0.02$). 38.8% of the total ingested CHO dose was oxidized after MD+¹³C-GAL+PRO, which was 8.5% higher than in the MD+¹³C-GAL trial (30.3%). The contribution of exogenous CHO, endogenous CHO and fat towards the total energy expenditure was: 0, 38.6, 61.4% (PL), 40.7, 20.7, 38.6% (MD+¹³C-GAL), 34.2, 33.1, 32.7% (MD+¹³C-GAL+PRO), respectively.

Conclusion: These results suggest that the inclusion of PRO in the mixture results in a higher amount of total CHO oxidized. However, at the same time adding PRO to the drink seems to increase endogenous CHO oxidation and decrease exogenous CHO and fat oxidation. On the other hand, MD+¹³C-GAL seems to promote higher contribution of exogenous CHO and fat but lower endogenous CHO to total energy expenditure, which is believed to be more beneficial to endurance performance.

References

1. Coyle EF: **Timing and method of increased carbohydrate intake to cope with heavy training, competition and recovery.** *J Sports Sci* 1991, **9(Suppl 1)**:29–52.
2. Ivy JL, Goforth HW Jr, Damon BM, McCauley TR, Parsons EC and Price TB: **Early postexercise muscle glycogen recovery is enhanced with a carbohydrate-protein supplement.** *J Appl Physiol* 2002, **93**:1337–1344.
3. Tsintzas K and Williams C: **Human muscle glycogen metabolism during exercise. Effect of carbohydrate supplementation.** *Sports Med* 1998, **25**:7–23.

P16

The combined effects of a pre-workout supplement and three weeks of high-intensity interval training on critical velocity, anaerobic running capacity, training volume, and body composition in men and women

Abbie Smith, David Fukuda, Kristina Kendall, Jennifer Graef, Jordan Moon and Jeffrey Stout
University of Oklahoma, Department of Health and Exercise Science, Metabolic and Body Composition Laboratory, Norman, OK 73019, USA
E-mail: jrstout@ou.edu

Journal of the International Society of Sports Nutrition 2009, **6(Suppl 1)**:P16

Background: A randomized, single-blinded, placebo-controlled, parallel design study was used to examine the effects of a pre-workout supplement combined with three weeks of high-intensity interval training (HIIT) on aerobic and anaerobic running performance, training volume, and body composition.

Methods: Twenty-five well-trained recreational athletes (mean \pm SD age = 21 \pm 2 yrs; stature = 172 \pm 9 cm; body mass = 66 \pm 12 kg, VO₂max = 48 \pm 9 ml \cdot kg⁻¹ \cdot min⁻¹, percent body fat = 19 \pm 7%) were assigned to either the active supplement (n = 12) or placebo (PL, n = 11) group. The active supplement (Game Time[®], GT, Corr-Jensen Laboratories Inc., Aurora, CO) was 18 g of powder, 40 kcals, and consisted of a proprietary blend including whey protein, cordyceps sinensis, arginine, creatine, citrulline, ginseng, and caffeine. The PL was also 18 g of powder, 40 kcals, and consisted of only maltodextrin, natural and artificial flavors and colors. Thirty minutes prior to all testing and training sessions, participants consumed their respective supplements mixed with 8–10 oz of water. Both

groups participated in a three week HIIT program three days per week, and testing was conducted before and after the training. Cardiovascular fitness (VO₂max) was assessed using closed circuit spirometry (Parvo Medics TrueOne[®] 2400 Metabolic Measurement System, Sandy, UT) during graded exercise tests on a treadmill (Woodway, Pro Series, Waukesha, WI). Also, four high-speed runs to exhaustion were conducted at 110, 105, 100, and 90% of the treadmill velocity recorded during VO₂max, and the distances achieved were plotted over the times-to-exhaustion. Linear regression was used to determine the slopes (critical velocity, CV) and Y-intercepts (anaerobic running capacity, ARC) of these relationships to assess aerobic and anaerobic performances, respectively. Training volumes were tracked by summing the distances achieved during each training session for each subject. Percent body fat (%BF) and fat-free mass (FFM) were assessed with air-displacement plethysmography (BOD POD[®], Life Measurement, Inc., Concord, CA).

Results: VO₂max increased significantly by 10.5% ($p = 0.039$) from pre- (3.38 L \cdot min⁻¹) to post-training (3.73 L \cdot min⁻¹) for the GT group, whereas the PL group did not change (3.08 to 3.17 L \cdot min⁻¹; $p = 0.161$). CV also increased significantly ($p = 0.006$) for the GT group by 2.8%, while the PL group did not change ($p = 0.257$; 1.8% increase). ARC increased ($p = 0.036$) for the PL group by 19.7%, and for the GT group by 9.9% ($p = 0.061$). Training volume was 11.6% higher for the GT versus PL group ($p = 0.032$). %BF decreased from 19.3% to 16.1% ($p = 0.170$) for the GT group and decreased from 18.0% to 16.8% in the PL group ($p = 0.044$). FFM increased significantly from 55.9 kg to 57.4 kg ($p = 0.035$) for the GT group, while FFM decreased from 53.4 kg to 53.1 kg ($p = 0.320$) in the PL group. There were no changes ($p > 0.05$) in any of the blood safety measures (glucose, HDL, and LDL).

Conclusion: These results supported the safety of GT and demonstrated improvements in VO₂max, critical velocity, and lean tissue mass when GT is combined with HIIT. Three weeks of HIIT alone also augmented anaerobic running performance and body composition.

Acknowledgements

This study was funded by Corr-Jensen Laboratories Inc., Aurora, CO.

P17

Effects of diet cycling during training on weight loss and resting energy expenditure: a preliminary analysis

Richard Kreider¹, Jean Jitomir², Julie Culbertson¹, Mike Byrd², S Simbo², Cecelia Curts², Monica Serra², Kristen Beavers², Jen Moreillon², Maria Ferreira², Rui Li², Brian Shelmadine², Chris Rasmussen¹ and Mike Greenwood²

¹Exercise & Sport Nutrition Lab, Texas A&M University, College Station, TX 77845, USA

²Exercise & Sport Nutrition Lab, Baylor University, Waco, TX 76798, USA

E-mail: rkreider@hkn.tamu.edu

Journal of the International Society of Sports Nutrition 2009, **6(Suppl 1)**:P17

Background: Long-term dieting has been reported to reduce resting energy expenditure (REE) leading to weight regain once the diet has been curtailed. Diets are also difficult to follow for a significant length of time. The purpose of this preliminary proof

of concept study was to examine the effects of short-term intermittent dieting during exercise training on REE and weight loss in overweight women.

Methods: 16 sedentary women (37 ± 7 yrs, 162 ± 6 cm; 89 ± 17 kg; $42.5 \pm 3\%$ body fat) were assigned to an exercise & normal diet group (E, $n = 6$) or an exercise and diet intervention group (ED, $n = 10$). Diets were maintained for 30 days and consisted of 1,200 kcals/d for 1-wk followed by ingesting 1,500 kcals/d for 3-wks. Subjects then followed a 2,200 kcals/d maintenance diet for 4 wks and repeated the cycle each month for 6-months. Diets were either 45% CHO, 30% PRO, and 25% F or 45% PRO, 30% CHO, and 25% F. Subjects participated in a supervised Curves circuit training program 3-d per wk and walked for 30-min 3-d per wk. Body weight, DEXA body composition, and REE measurements were obtained at 0, 1, 2, 3, 4, and 5 months and were analyzed by repeated measures ANOVA. Data are presented as means \pm SD changes from baseline for the E and ED groups, respectively, at 1, 2, 3, 4, and 5 months.

Results: Preliminary results revealed that subjects in the ED group lost significantly more weight (E 0.4 ± 2.9 , -2.9 ± 2.5 ; -1.8 ± 4.1 , -1.9 ± 5.1 ; ED -6.7 ± 3.0 ; -8.7 ± 4.5 , -10.8 ± 6.7 ; -11.3 ± 7.3 lbs, $p = 0.03$) and tended to lose more fat mass (E $0.83.0$, -3.0 ± 3.8 ; -1.0 ± 4.5 , -1.5 ± 3.7 ; ED -4.4 ± 3.6 ; -6.4 ± 3.5 , -7.5 ± 5.2 ; -7.5 ± 6.6 lbs, $p = 0.11$) than subjects in the E groups. REE rebounded after dieting during each maintenance phase in the ED group (E 19.4 ± 2.2 , 19.1 ± 1.6 , 18.4 ± 1.7 , 18.4 ± 1.9 ; 18.2 ± 1.6 ; ED 19.0 ± 1.3 , 18.1 ± 1.6 , 19.3 ± 2.2 , 18.2 ± 1.7 , 18.6 ± 1.5 , kcal/kg, $O4 p = 0.004$).

Conclusion: Preliminary results indicate that following 30 day cycles of dieting/maintenance can promote gradual weight loss while allowing for a rebound in REE during the maintenance phase. This strategy may be an effective way to promote weight loss without concomitant reductions in resting metabolism.

Acknowledgements

This study was funded by Curves International, Waco, TX.

P18

Effects of 28 days of resistance exercise and consuming a commercially available pre-workout supplement, NO-Shotgun[®], on body composition, muscle strength and mass, markers of satellite cell activation, and clinical safety markers in males

Brian Shelmadine¹, Matt Cooke¹, Thomas Buford¹, Geoffrey Hudson¹, Liz Redd¹, Brian Leutholtz¹ and Darryn Willoughby^{1,2}

¹Department of Health, Human Performance, and Recreation, Baylor University, Box 97313, Waco, TX 76798, USA

²Institute for Biomedical Science, Baylor University, Waco, TX 78798, USA

E-mail: Darryn_Willoughby@baylor.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P18

Background: This study determined the effects of 28 days of heavy resistance exercise combined with the nutritional supplement, NO-Shotgun[®], on body composition, muscle strength and mass, markers of satellite cell activation, and clinical safety markers.

Methods: Eighteen non-resistance-trained males participated in a resistance training program (3×10 -RM) 4 times/wk for

28 days while also ingesting 27 g/day of placebo (PL) or NO-Shotgun[®] (NO) 30 min prior to exercise. Data were analyzed with separate 2×2 ANOVA and t-tests ($p < 0.05$).

Results: Total body mass was increased in both groups ($p = 0.001$), but without any significant increases in total body water ($p = 0.77$). No significant changes occurred with fat mass ($p = 0.62$); however fat-free mass did increase with training ($p = 0.001$), and NO was significantly greater than PL ($p = 0.001$). Bench press strength for NO was significantly greater than PL ($p = 0.003$). Myofibrillar protein increased with training ($p = 0.001$), with NO being significantly greater than PL ($p = 0.019$). Serum IGF-1 ($p = 0.046$) and HGF ($p = 0.06$) were significantly increased with training and for NO HGF was greater than PL ($p = 0.002$). Muscle phosphorylated c-met was increased with training for both groups ($p = 0.019$). Total DNA was increased in both groups ($p = 0.006$), while NO was significantly greater than PL ($p = 0.038$). For DNA/protein, PL was decreased and NO was not changed ($p = 0.014$). All of the myogenic regulatory factors were increased with training; however, NO was shown to be significantly greater than PL for Myo-D ($p = 0.008$) and MRF-4 ($p = 0.022$). No significant differences were located for any of the whole blood and serum clinical chemistry markers ($p > 0.05$).

Conclusion: When combined with heavy resistance training for 28 days, NO-Shotgun[®] is not associated with any negative side effects, nor does it abnormally impact any of the clinical chemistry markers. Rather, NO-Shotgun[®] effectively increases muscle strength and mass, myofibrillar protein content, and increases the content of markers indicative of satellite cell activation.

Acknowledgements

We would like to thank the individuals that participated as subjects in this study. This study was supported by a supplement donation from VPX (Davie, FL) to Baylor University.

P19

The combined effects of exercise training and ingestion of a weight loss supplement on body composition and fitness parameters in college-aged males and females

Chad Kerksick, Patrick Tucker, Mike Roberts, Vincent Dalbo, Brett Billbe and Nick DeBolt
Department of Health and Exercise Science, University of Oklahoma, Norman, OK 73019, USA
E-mail: Chad_Kerksick@ou.edu

Journal of the International Society of Sports Nutrition 2009, 6(Suppl 1):P19

Background: A randomized, double-blind, placebo-controlled study was performed to evaluate the effect of a weight loss supplement on body composition and fitness parameters following 8 weeks of supplementation and concomitant exercise training in college-aged males and females.

Methods: Weight, BMI, bench press 1 RM, leg press 1 RM, body composition parameters, VO_{2Max} , fasting glucose and lipid panels were evaluated before (pre-test) and after (post-test) 56 days (8 weeks) of resistance and cardiovascular training, performed three times per week (totaling 24 workouts). Resistance training consisted of two sets of 12 repetitions of the following exercises: seated leg press, bench press, leg extension, leg curl, seated military press, lat pull, and cable

row (75–80% 1 RM). Cardiovascular training consisted of 30 minutes on a cycle ergometer at a predetermined heart rate (70–85% heart rate reserve). Both resistance and cardiovascular training intensity was increased every two weeks. Additionally, during the testing period, subjects consumed two doses per day of a weight loss supplement (n = 12) or placebo (n = 12) as well as a once daily protein supplement.

Results: Fat mass and percent body fat were significantly reduced ($p < 0.05$) in both groups. These differences were not statistically significant between groups. Consumption of a protein supplement and a weight loss supplement or protein supplement alone, while following a diet and exercise program, resulted in a significant decrease in fat mass and percent body fat and non-significant decreases in body mass and non-significant increases in lean mass. Fitness status (upper-body strength, lower-body strength, VO₂) significantly increased ($p < 0.05$) in both groups,

but these differences were not statistically significant between groups. Lipid panels markers (e.g., triglycerides, total cholesterol, LDL cholesterol, HDL cholesterol) all experienced non-significant improvements in both groups, while serum glucose levels improved to a greater extent ($p < 0.05$) in the supplementation group.

Conclusion: A daily protein supplement in conjunction with a thrice weekly resistance training and cardiovascular exercise program increased fitness levels, decreased body and fat mass, improved body composition and improved clinical markers of coronary heart disease. Weight loss supplementation sustained these outcomes, while conferring an additional benefit for changes in serum glucose levels.

Acknowledgements

The authors would like to thank Champion Nutrition, Inc. (Sunrise, FL) for sponsoring this study.