

**BOB
SEEBOHAR**

MS, RD, CSSD, CSCS, METS



Nutrition Periodization for Endurance Athletes

Bob Seebohar, MS, RD, CSSD, CSCS, METS

Board Certified Specialist in Sports Dietetics

Exercise Physiologist

NSCA Certified Strength and Conditioning Specialist

USA Triathlon Level III Elite and Youth/Junior Coach

What About Bob?

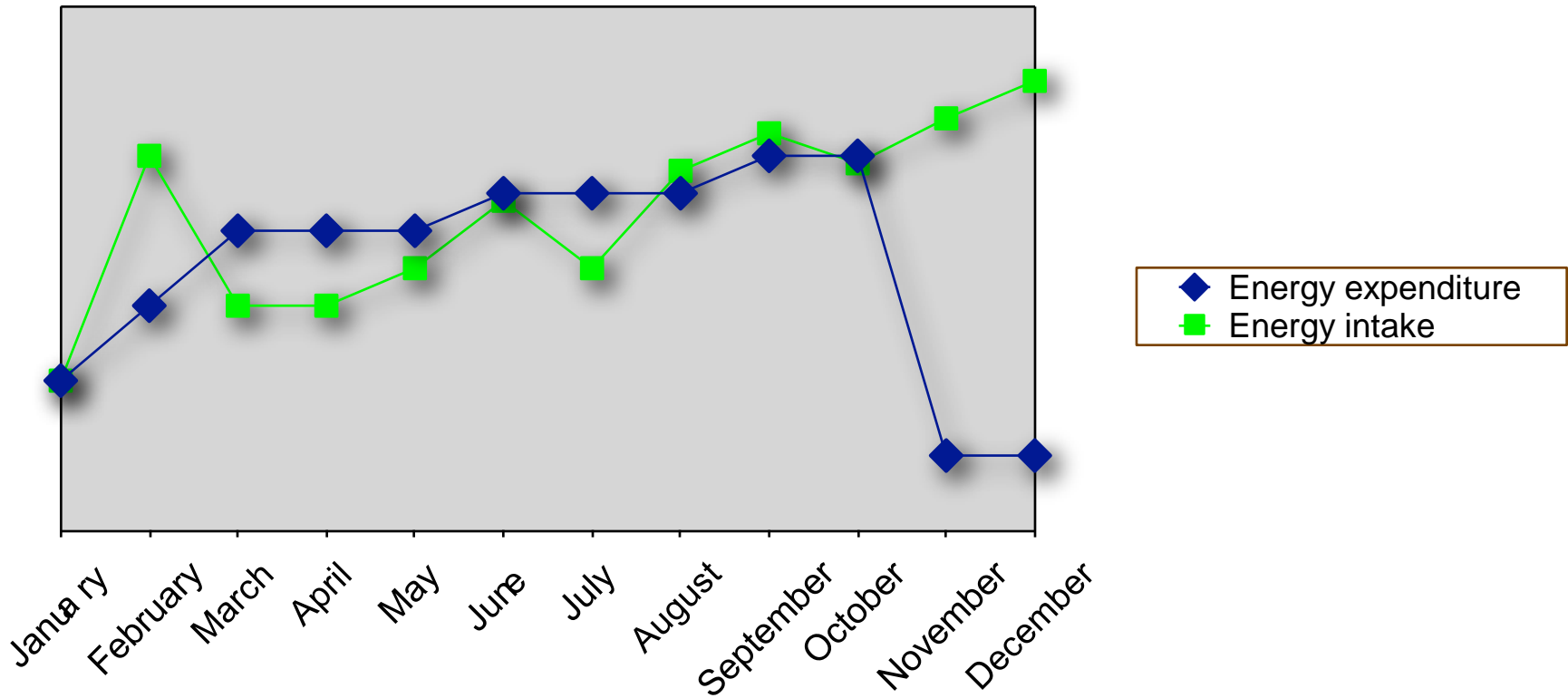
- BS-Exercise and Sport Science
 - MS-Health and Exercise Science
 - MS-Food Science and Human Nutrition
 - Registered Dietitian (RD)/ Board Certified Specialist in Sports Dietetics (CSSD)
 - Exercise Physiologist
 - Certified Strength and Conditioning Specialist (CSCS)
 - Past Director of Sports Nutrition, University of Florida
 - Past Sport Dietitian, United States Olympic Committee
 - 2008 Olympic Team Sport Dietitian/Coach
 - USAT Level III Elite and Youth/Junior Certified Coach
 - Competitive triathlete
 - Creator of the Nutrition Periodization and Metabolic Efficiency Training concepts
-

Objectives

- Introduce and explain the concept of nutrition periodization
- Discuss the concept of metabolic efficiency training
- Provide nutrient timing strategies for before, during and after training sessions
- Provide athlete examples

What is the main nutrition limiter to performance?

Periodization Mismatch



Nutrition Periodization

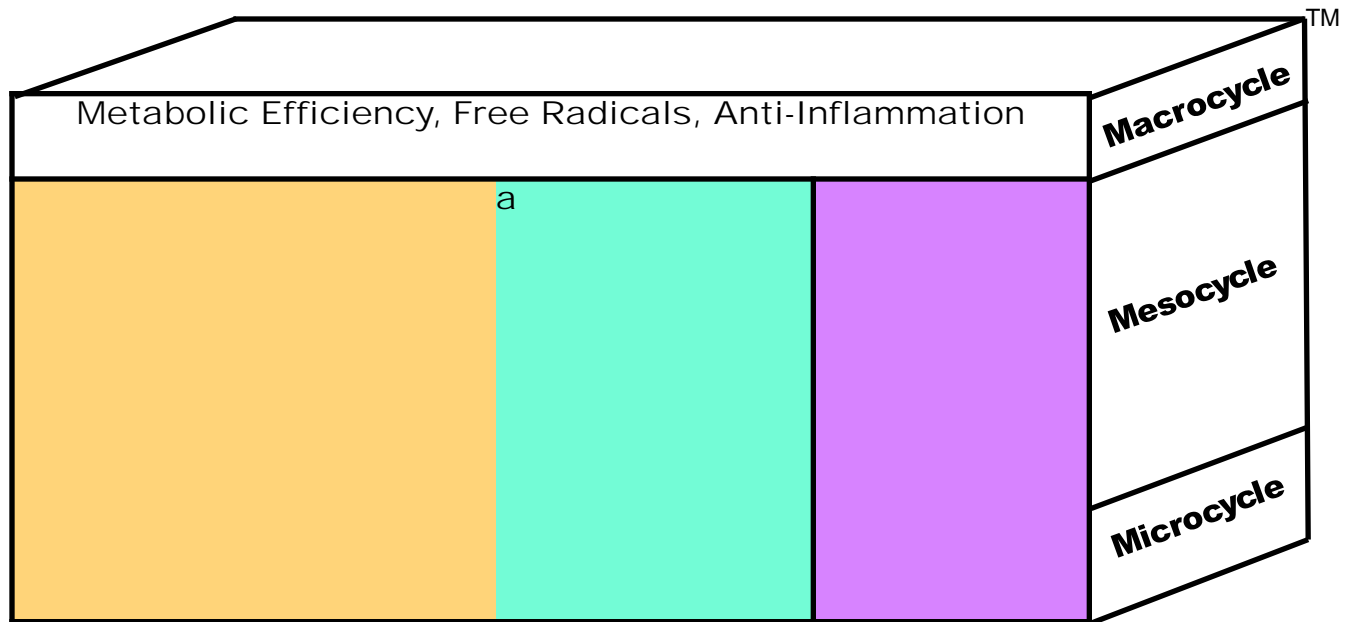
SUPPORT the body's energy needs associated with the different training **VOLUME** and **INTENSITY** stressors throughout the training year to elicit positive physiological responses.

"Eat to train, don't train to eat."™

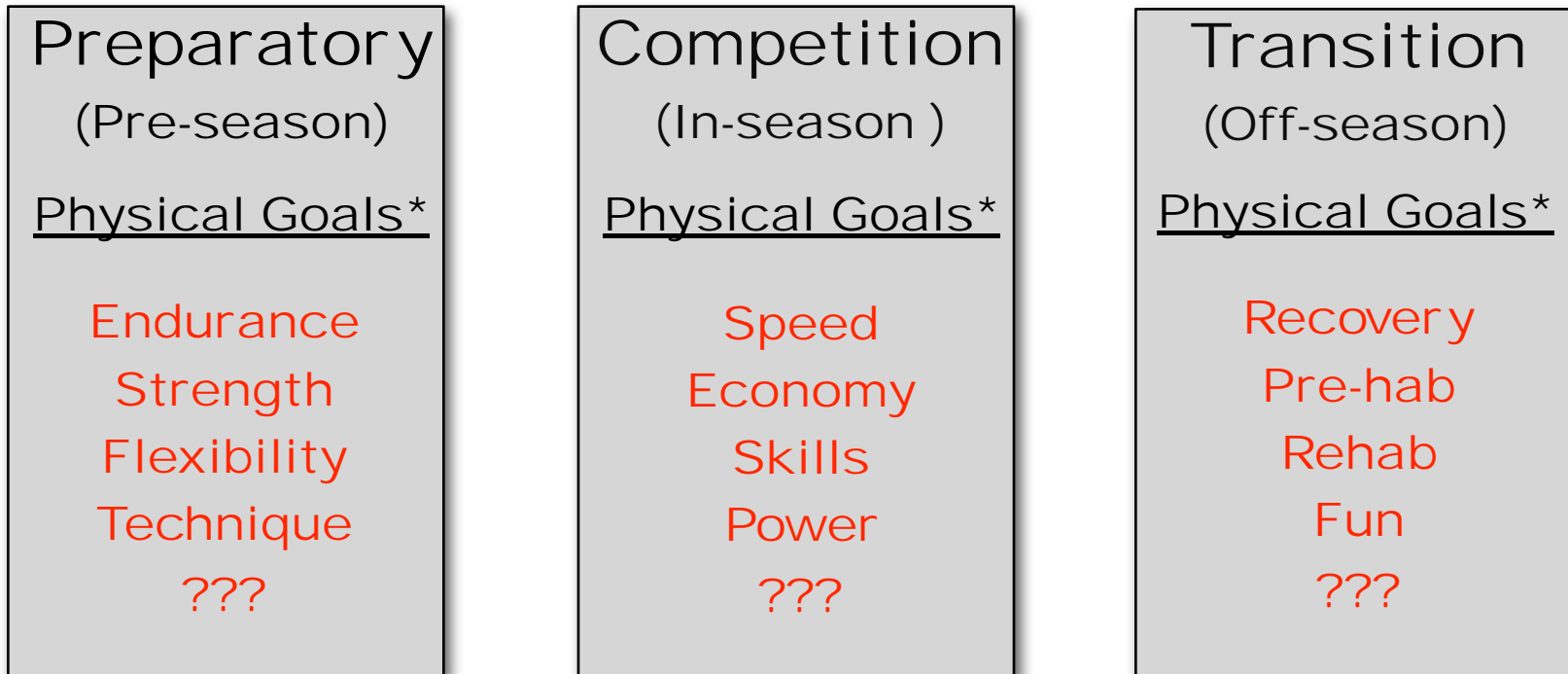
Nutrition Periodization Goals

1. Manipulate body weight and composition
2. Improve blood sugar/insulin control
3. Improve metabolic efficiency
4. Support immune health
5. Periodize supplement use

Nutrition Periodization



Mesocycles



**Physical goals are athlete specific.*

Prep Cycle Daily Nutrition Goals

Preparatory
(Pre-season)

Physical Goals

Endurance
Strength
Flexibility
Technique
???

- Learn about iron stores and inflammation
- Eat to reduce inflammation
- Learn “eat to train”
- Improve blood sugar response

Prep Cycle Nutrient Timing

Nutrient	Before	During	After
Fluid	0.07-0.10 oz/lb of weight 4 hours pre 0.04-0.10 oz/lb of weight 2 hours pre	Research: 3-8 oz/15 minutes* Bob: Instincts and smarts	24 oz for every pound lost
Carbohydrate	Meal/light snack depending on mode	Duration dependent	Snack
Protein	Meal/light snack depending on mode	Duration, intensity and mode dependent	Snack
Fat	Meal/light snack depending on mode	Probably not	Type dependent
Sodium	Meal/snack	Just enough to promote fluid balance	~300-500 mg

**Dependent upon individual sweat rate.*

Comp Cycle Daily Nutrition Goals

Competition
(In-season)

Physical Goals

Speed
Economy
Skills
Power
???

- Eat to reduce inflammation
- Swim/bike/run specific nutrition
- Competition simulation eating
- Optimize blood sugar response

Comp Cycle Nutrient Timing

Nutrient	Before	During	After
Fluid	0.07-0.10 oz/lb of weight 4 hours pre 0.04-0.10 oz/lb of weight 2 hours pre	Research: 3-8 oz/15 minutes* Bob: Instincts and smarts	24 oz for every pound lost
Carbohydrate	Meal/light snack depending on practice goals	Research: 30-90 g/hr Real life: Metabolic Efficiency (ME)	Research: 1.0-1.2 g/kg Real life: is this too much based on ME?
Protein	Meal/light snack depending on practice goals	Minimal: muscle damage/ soreness	Resesarch: 10-20 grams
Fat	Meal/light snack depending on practice goals	Maybe, type dependent	No
Sodium	Meal/snack	Research: 500-700 mg/L/fluid Bob: measure (300+)	~300-500 mg

*Dependent upon individual sweat rate.

Trans Cycle Daily Nutrition Goals

Transition
(Off-season)

Physical Goals

Recovery

Pre-hab

Rehab

Fun

???

- Emotional connection to food
- Sport nutrition products vs. food
- Off-season fitness/body composition goals
- Prevent significant fluctuations in body fat and fat weight

Trans Cycle Nutrient Timing

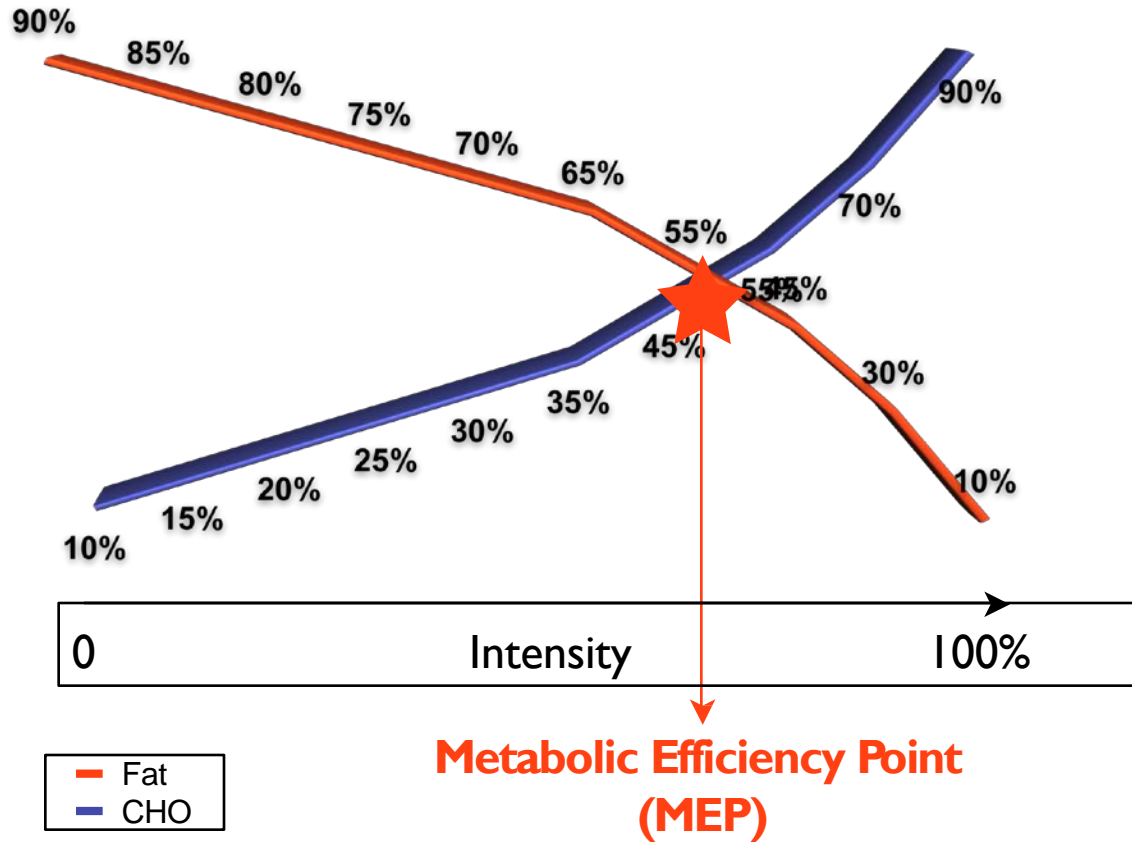
Nutrient	Before	During	After
Fluid	Have	Instincts and smarts	24 oz for every pound lost
Carbohydrate	some	X	X
Protein	water	X	X
Fat	and a	X	X
Sodium	snack	Maybe	~300-500 mg

Metabolic Efficiency Training (MET)

Can you believe it?

- 49 year-old male, Ironman (IM) athlete, 2009 IM Louisville, 10:02, no GI distress, **86 calories consumed/hour**
- Same athlete, 2010 IM St. George, 11:13, no GI distress, **73 calories consumed/hour**
- Same athlete, 2010 Kona, 10:23, no GI distress, **94 calories consumed/hour**
- 37 year-old male ultrarunner, Leadville 100 mile run, 28:10, **133 calories consumed/hour**, GI distress when consumed simple sugars
- 57 year-old female ultrarunner, 55 mile road race, 10:53, no GI distress, **50 calories consumed/hour**

Metabolic Efficiency



Combined interventions

Metabolic Inefficiency

Poor utilization of fat stores



Increased reliance on endogenous CHO stores



Increased need for supplemental CHO



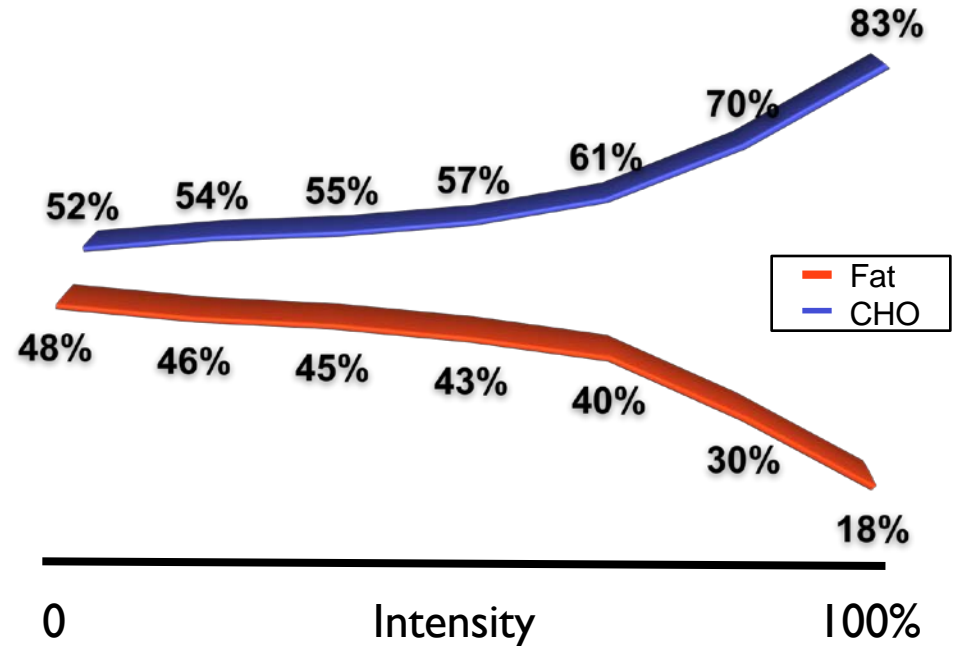
Higher risk of GI distress



Higher body weight and fat



Increased risk of disease



Metabolic Efficiency Point Non-Existent

Metabolic Efficiency Training

Improving the body's efficiency of utilizing endogenous stores of carbohydrate and fat at different intensities and durations of exercise and at rest.

Mobilize a higher amount of almost unlimited endogenous fat stores while preserving very limited endogenous carbohydrate stores.

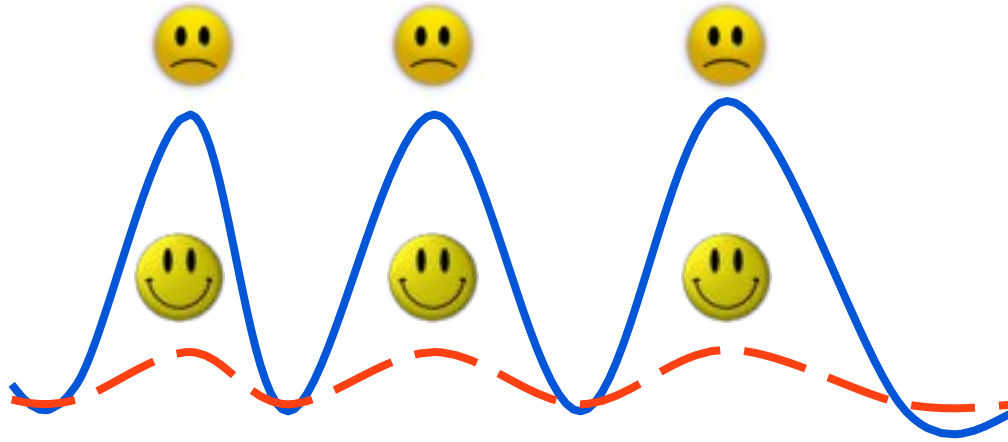
Metabolic Efficiency Training Goals

1. Improves nutrient partitioning for energy use
2. Decreases risk of GI distress
3. Improves body weight and composition
4. Improves health parameters

Benefits of MET

Weight and body fat loss	Reduced GI distress	Improved fasting blood sugar levels
Better fasting insulin levels	Improved concentration and focus	Improved mood states
Better satiety	Lower calorie needs per hour during exercise	Ability to follow a lower sodium eating plan
Improved blood lipid profile	More sustained energy and better recovery	Improved HbA1c levels
Improve sleep	Reduce food cravings	Decrease risk of chronic disease states

Is There a Secret?



- High levels of **insulin** inhibits lipolysis
 - *Insulin activates protein phosphatase 2A*
 - *Dephosphorylates HSL and inhibits its activity*

Protein + Fiber + Fat

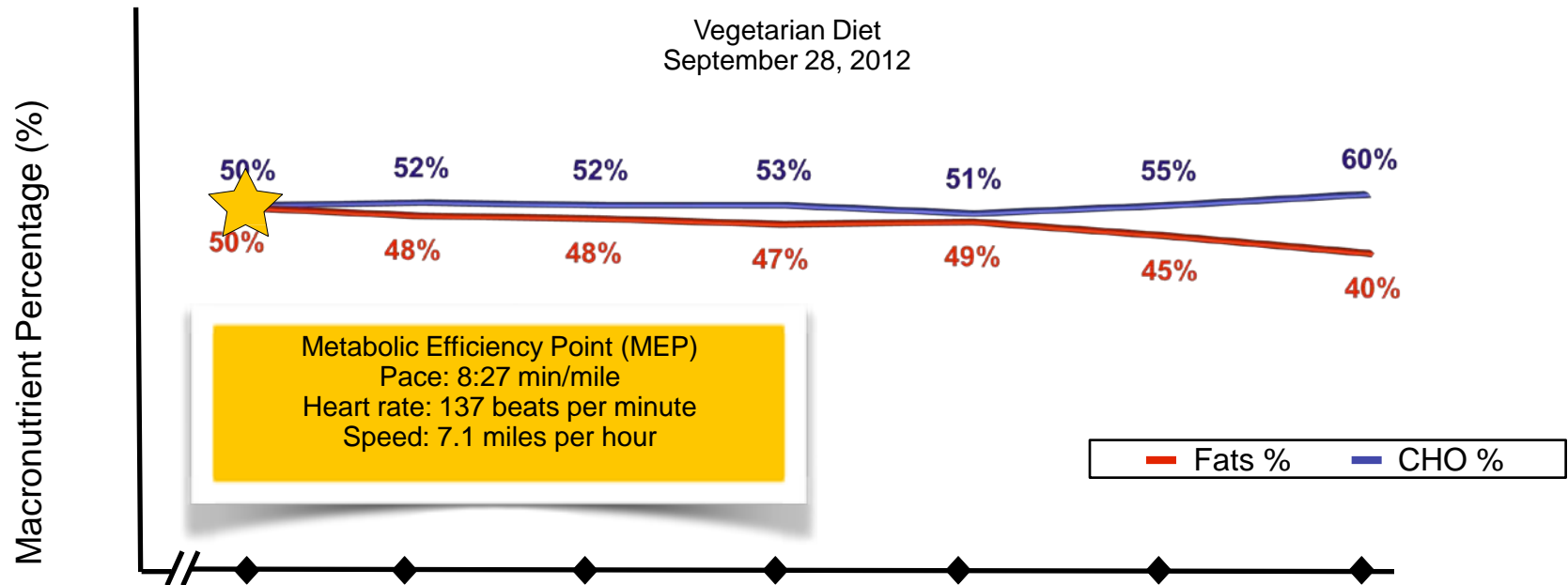
Improving Metabolic Efficiency

First and foremost:

Must utilize Nutrition Periodization concept

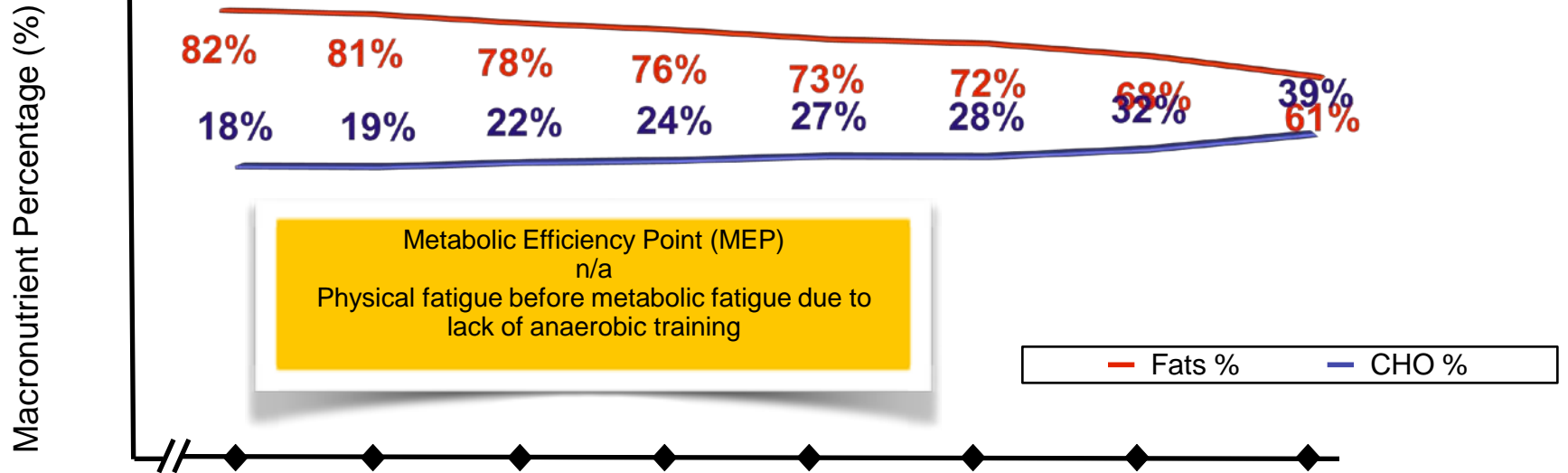
1. Carbohydrate to protein ratios and the Hand Model
2. Periodization Plates™
3. Carbohydrate *UM*loading
4. Low carbohydrate, high fat plan
5. Fat adaptation/carbohydrate restoration strategy

Male Triathlete/Ultra-Runner



Time (minutes)	5	10	15	20	25	30	35
Miles per hr	7.1	7.4	7.7	8	8.3	8.6	8.9
Heart rate (bpm)	137	139	148	151	157	162	169

Animal Protein Diet
November 3, 2012

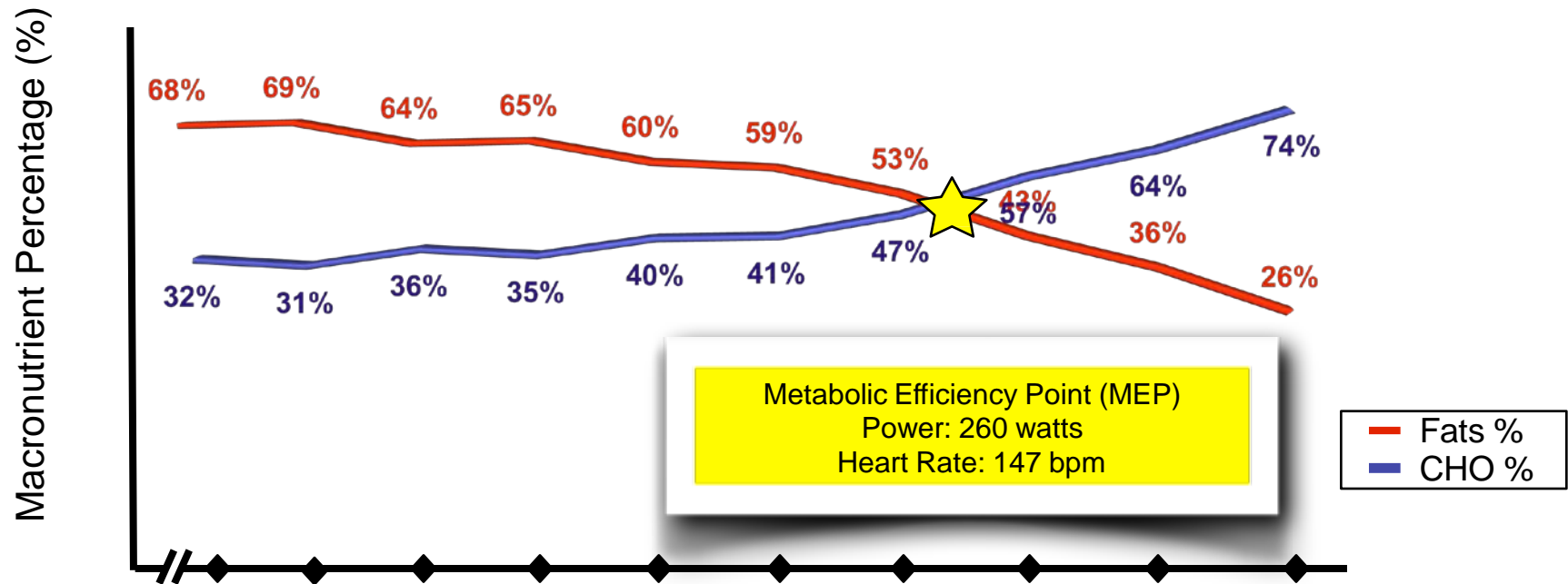


Time (minutes)	5	10	15	20	25	30	35	40
Miles per hr	7.1	7.4	7.7	8	8.3	8.6	8.9	9.2
Heart rate (bpm)	136	141	146	152	158	162	166	171

Blood Work Comparisons

	09/28/2012	11/03/2012
Total Cholesterol	214	205 (decrease of 4%)
LDL	141	133 (decrease of 6%)
HDL	55	62 (increase of 13%)
VLDL	18	10 (decrease of 55%)
Triglycerides	88	52 (decrease of 41%)

Cyclist

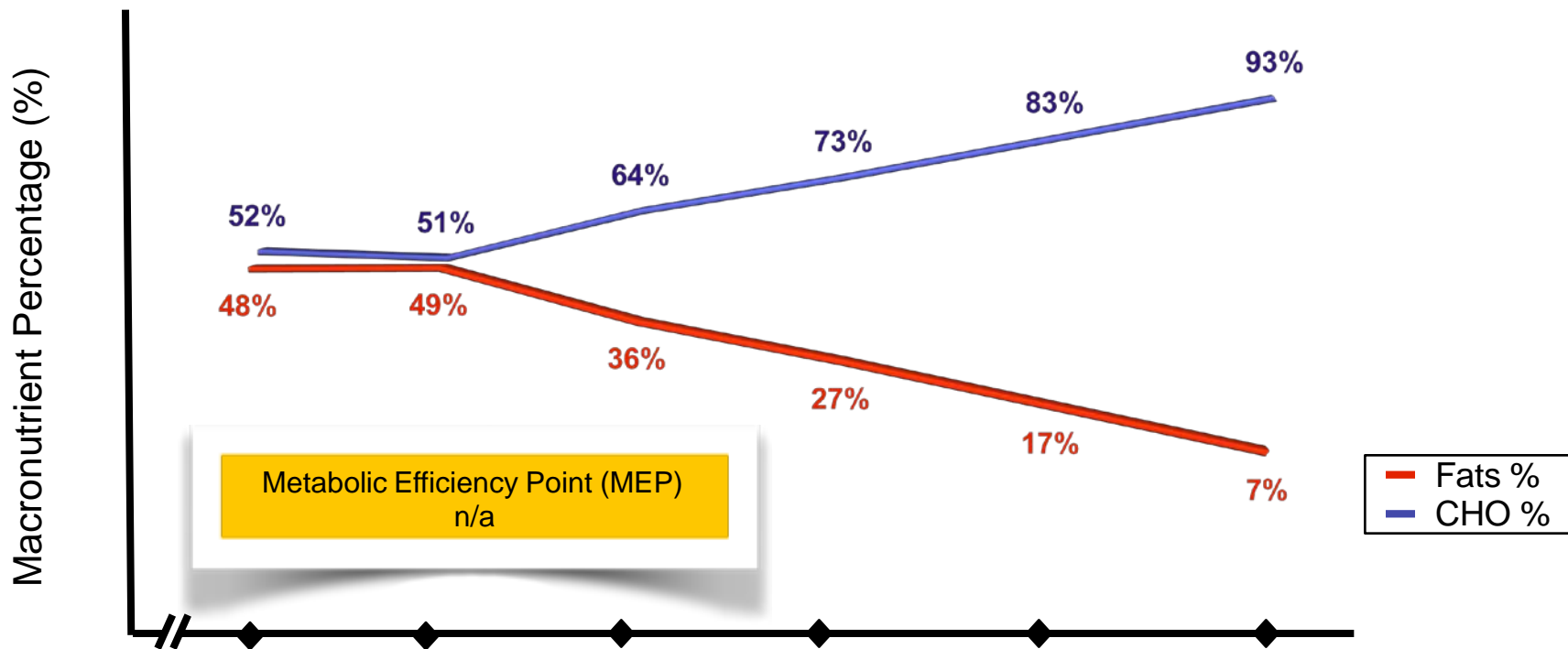


Metabolic Efficiency Point (MEP)
 Power: 260 watts
 Heart Rate: 147 bpm

- Fats %
- CHO %

Time (minutes)	5	10	15	20	25	30	35	40	45	50
Watts	100	125	150	175	200	225	250	275	300	325
RER/RQ	0.79	0.8	0.81	0.8	0.82	0.83	0.84	0.87	0.89	0.92
Kcal burned/hr	465	539	587	716	786	872	966	1077	1172	1356
CHO burned (kcal/hr)	149	167	211	251	314	358	454	614	750	1003
CHO burned (gr/hr)	37	42	53	63	79	90	114	154	188	251
FAT burned (kcal/hr)	316	372	376	465	472	514	512	463	422	353
FAT burned (gr/hr)	35	41	42	52	52	57	57	51	47	39
Heart rate (bpm)	98	101	108	114	123	131	141	150	156	162

Runner



Time (minutes)	5	10	15	20	25	30
Minute/mile	9:14	8:42	8:13	7:47	7:24	7:04
RER/RQ	0.86	0.86	0.89	0.92	0.94	0.97
Kcal burned/hr	653	660	729	732	798	863
CHO burned (kcal/hr)	340	337	467	534	662	837
CHO burned (gr/hr)	85	84	117	134	166	216
FAT burned (kcal/hr)	313	323	262	198	136	60
FAT burned (gr/hr)	35	35	29	22	15	7
Heart rate (bpm)	134	138	144	151	155	160

Application of MET

**Inappropriate CHO load
and lack of periodized
nutrition and aerobic
training**



**Poor utilization of body
fat stores for energy**



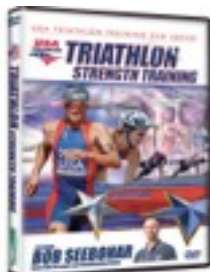
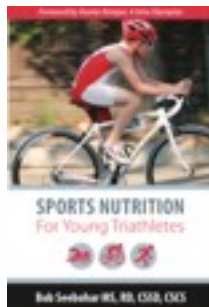
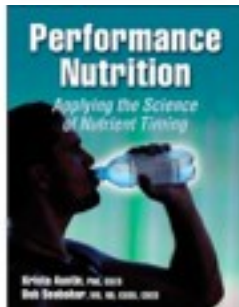
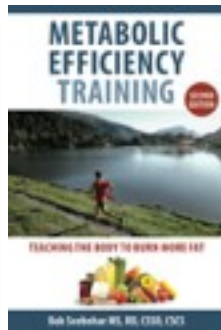
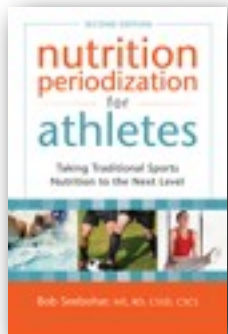
**More reliance on
supplemental CHO;
possible weight/fat gain**



**Inability to properly feed during
training/racing**
Increased incidence of GI distress
Lower power/velocity
Poor health markers

Thank you!

Resources



bob@enrgperformance.com

www.enrgperformance.com

www.bobseebohar.blogspot.com

E-books

- Fuel4mance Smoothie Recipe Book
- The Athlete's Food Guide to Metabolic Efficiency
- The Metabolic Efficiency Recipe Book
- Sodium Loading Protocol for Endurance Athletes
- Neuromuscular, Dynamic and Functional Exercises for Athletes
- Caffeine Protocol for Athletes
- Prehabilitation Exercises for Athletes
- Performance Nutrition for Soccer Players

Webinars/Certifications/Mentor Programs

- www.enrgperformance.com

© eNRG performance, LLC 2015. All rights reserved.

Content may not be reproduced without permission from eNRG performance, LLC.