The Power of G-Flux
Build Muscle, Lose Fat, and Boost Athletic Performance

John M Berardi, PhD, CSCS

About Me

Athletic Background
Jr. national level track and field athlete
Jr. national rugby athlete
1995 NABBA Jr. USA bodybuilding champion
University football athlete

Academic Background
Adjunct Professor at University of Texas at Austin
Ph.D. in Kinesiology (Exercise and Nutritional Biochemistry)
Masters training in Exercise Physiology
Undergrad training in Health Sciences, Psych, Philosophy

Professional Background
NSCA Certified Strength and Conditioning Specialist
Author of over 300 articles, 15 scientific papers & textbook chapters, & 5 books
President of Precision Nutrition

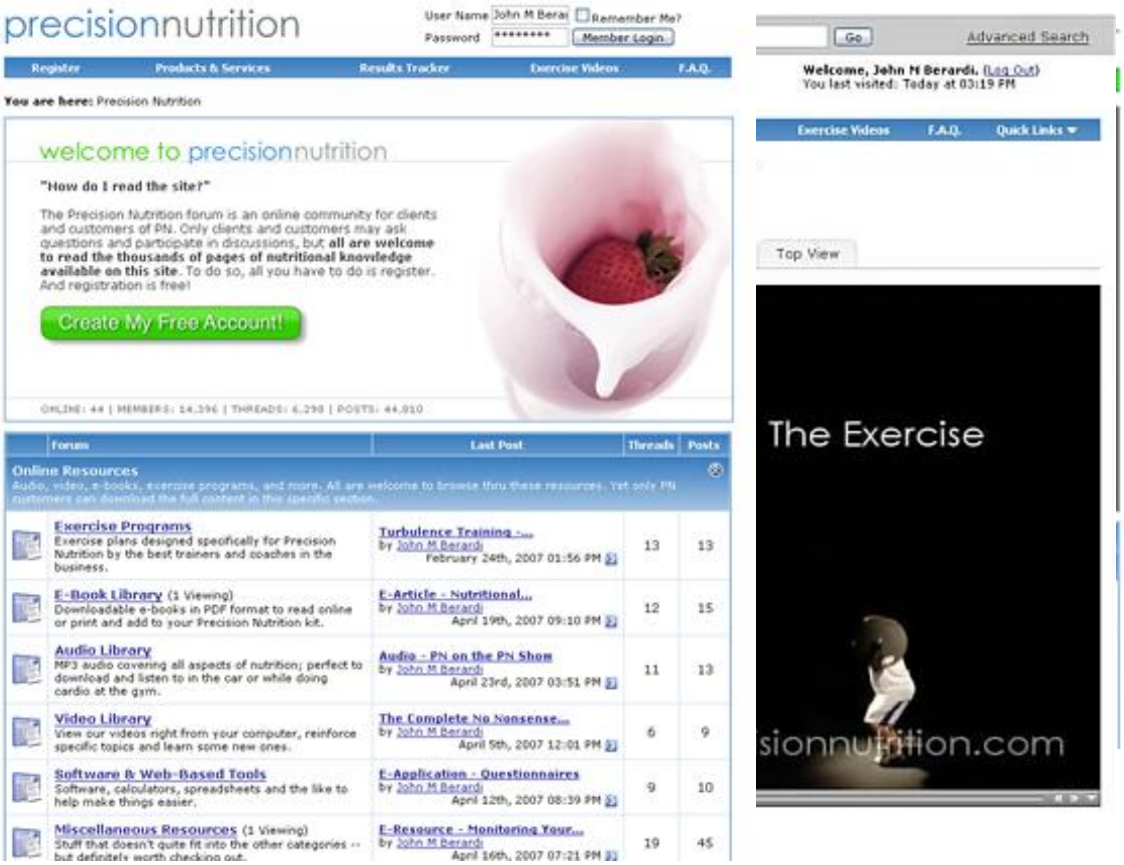
The Precision Nutrition Story

Precision Nutrition was created as an education system for elite athletes.

The program not only grew in the athletic community but it took off in recreational exercisers everywhere.

What Is Precision Nutrition?

Technology and Support Community



To pick up a copy of Precision Nutrition

Click here to read more about PN

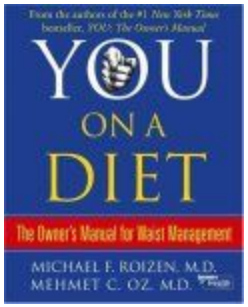
http://www.precisionnutrition.com/system.html

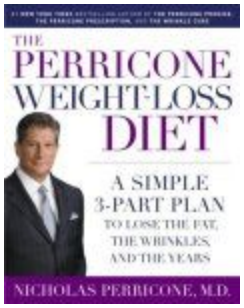
To check out our online PN Forums

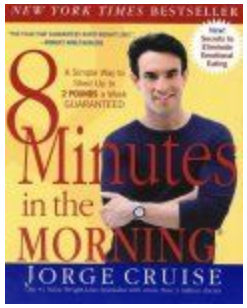
http://www.precisionnutrition.com/members/index.php

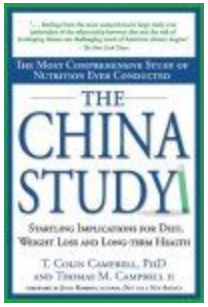
My 3 Goals This Weekend

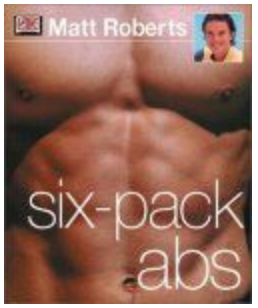
- Teach you the core Precision Nutrition principles.
- Give you a theoretical foundation for these ideas.
- Provide practical take-home strategies for immediate use.



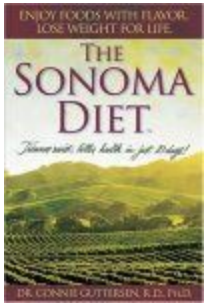


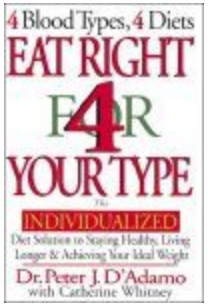


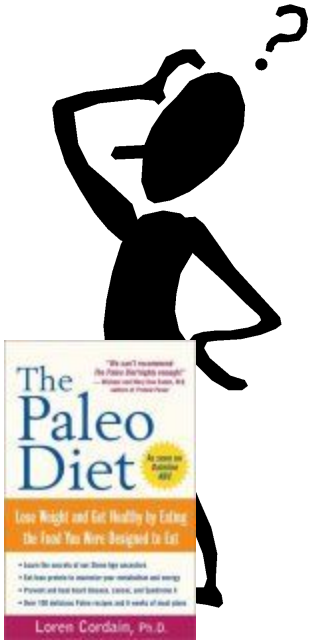


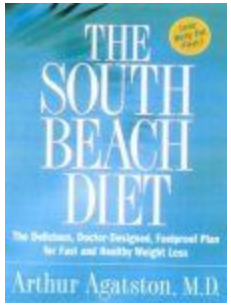


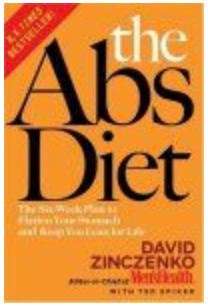
Introduction

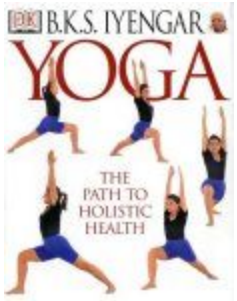


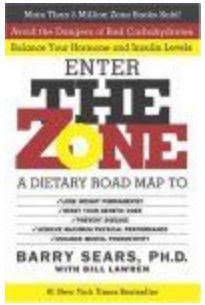


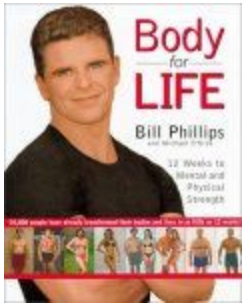












Words of Wisdom

Tips for making sense of it all:

1) What are the <u>commonalities</u> among successful programs? <u>Focus on them</u>…

2) What are the people you'd like to emulate doing? <u>Mentor with them</u>…

Keep in mind that you are an individual and what works for one person might not work for all people. *Let's list some differences between people leading to different prescriptions…*

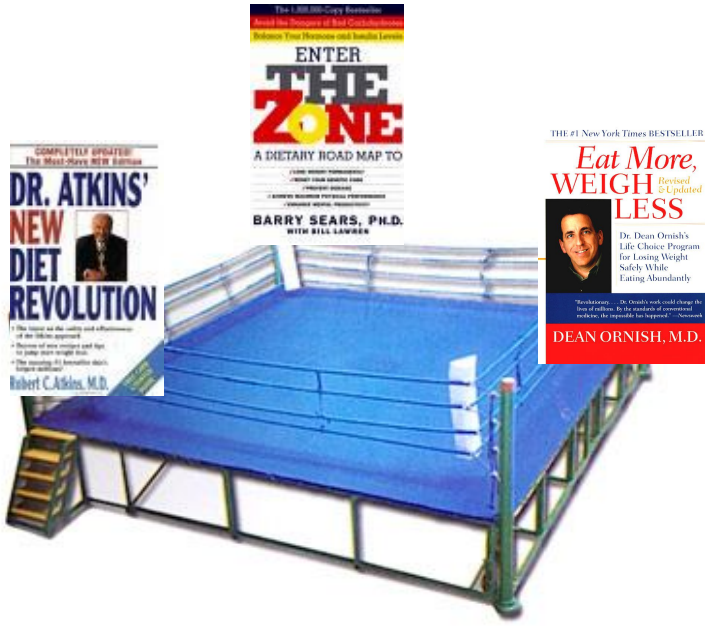
Common Themes

In the end, there is <u>one common denominator</u> among ALL body composition programs that get great results – whether the results are muscle building, fat loss, an overall healthy physique, etc. *What is it?*

Of Atkins, Sears and Ornish

Let's get practical…

Riddle me this…how can all three programs produce successful weight loss results in the SAME populations?



Of Atkins, Sears and Ornish

2 Words:

Maxilomandibular Fixation

Obviously, not all plans are created equal.
Weight loss is one thing…

Losing fat
Preserving bone mass & lean mass
Keeping nutrient intake high
Improving blood and cellular health

Ways of Creating a Negative Energy Balance

Since most of the world's exercising population wants to be leaner, what are some specific ways
to achieve a negative energy balance?

Controlling Energy Balance

What's the goal here if we want to control energy balance while maximizing health and optimizing body composition?

Eat as much quality food as possible

- Preserving bone mass & lean mass
- Keeping nutrient intake high
- Improving blood and cellular health

Yet closely balancing out our energy needs

Nutritional Disclaimer

Most North Americans move too little

PERIOD

Nutritional Disclaimer

Think of North America's Obesity Problem…

The body is programmed to regulate weight.
So why is North America so over fat even in the fact of chronic dieting?

Low energy expenditure and sedentary lifestyles lead to dysregulation.
Sedentary,
thrifty, and older individuals share one thing in common – low energy expenditure.

Yes, nutrition makes a difference but we see athletes eating poorly all the time without becoming obese. Why?

Their **high activity** keeps body weight regulation tighter.

Nutrition Disclaimer

A logical stepwise approach to fitness:

1) Get people moving more
2) Get them selecting better foods
3) Add exercise to promote positive adaptation
4) Begin to improve calorie balance
5) Begin to improve nutrient timing
6) Focus on maximizing G-Flux
    1) Optimized training loads, volume, intensities
    2) Optimized intake for activity and body type

Move More

Remember this:

Success leaves clues

Move More

Graph #1:

Relationship between hours of exercise per week and happiness with body:

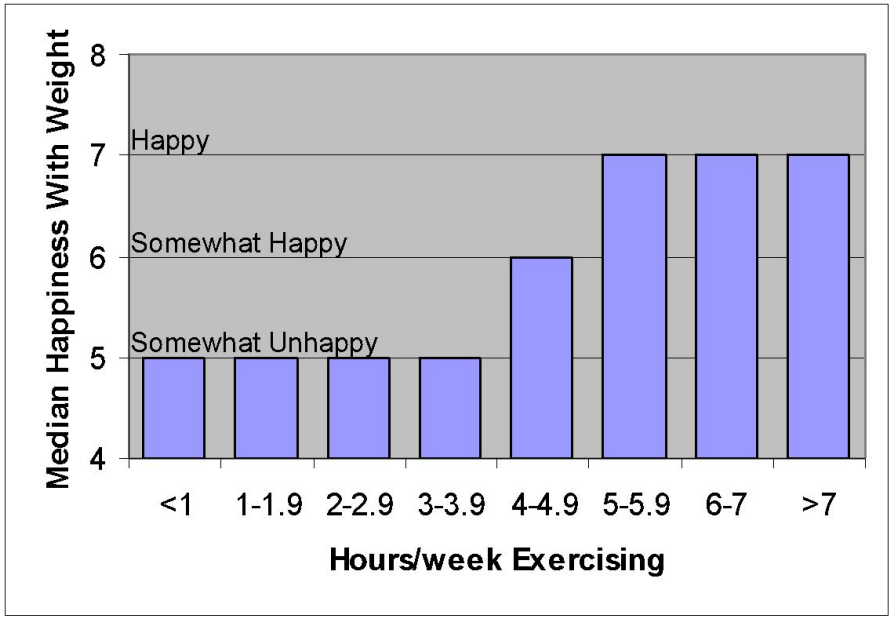


Figure 2

Move More

Graph #2:

Relationship between intensity of exercise and happiness with body:

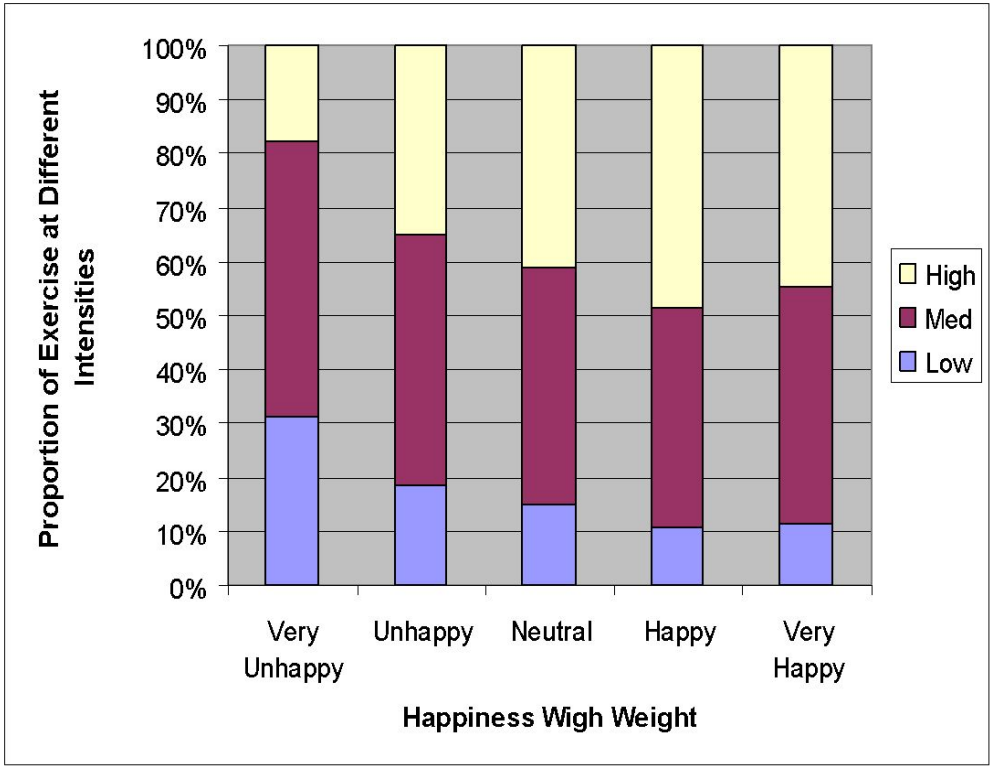


Figure 4

Move More

Graph #3:

Self-monitoring - Recording or keeping track of what you do.

Pre-contemplation
Contemplation
Preparation
Action
Maintenance
Transformed
Always Exercised

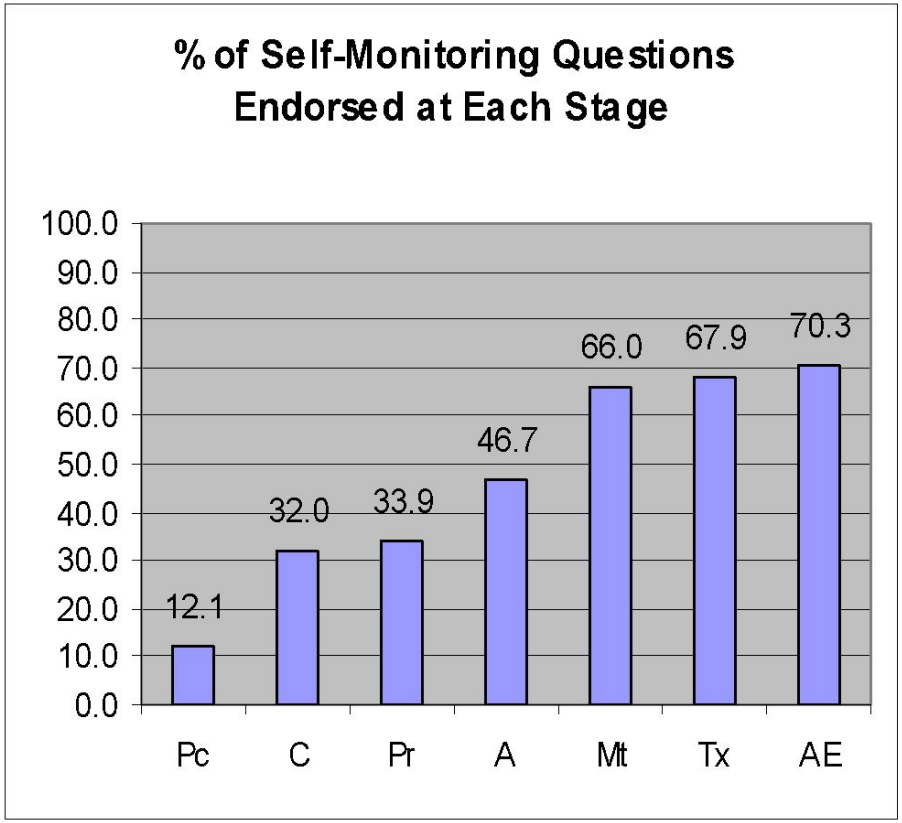


Figure 5

Move More

Graph #4

Goal setting – Specific, challenging but attainable, & have short- & long-term targets.

Outcome goals?

Behavior goals?

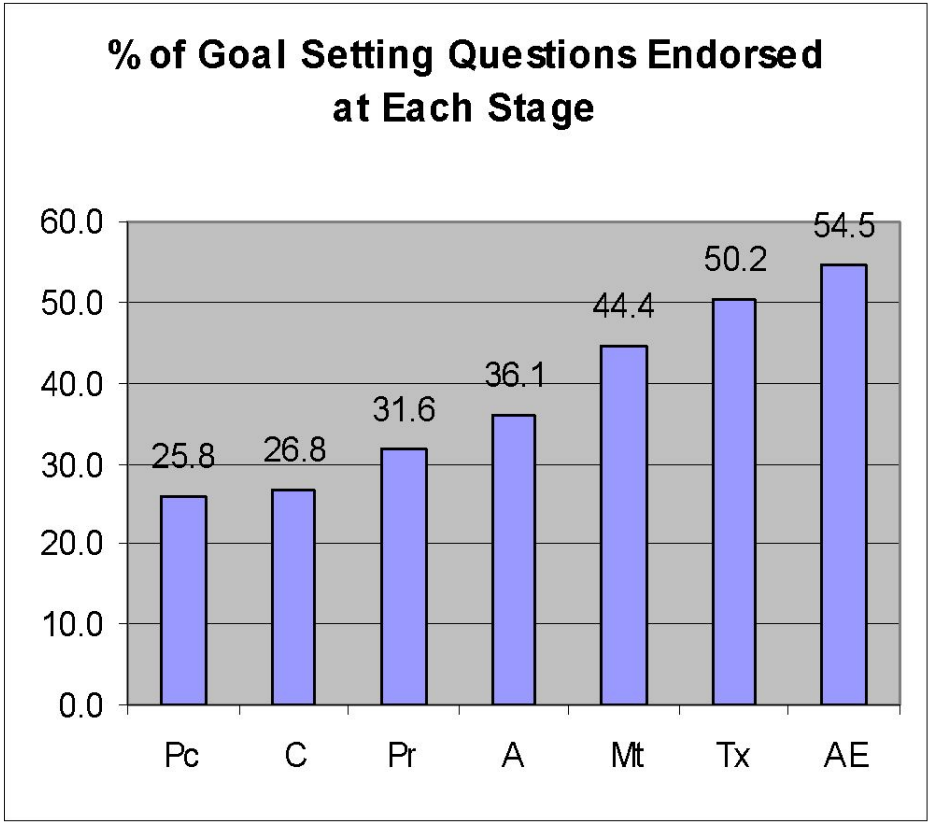


Figure 6

Move More

Graph #5:

Program Variety – Systematically varying an exercise program (called periodization by coaches and athletes)

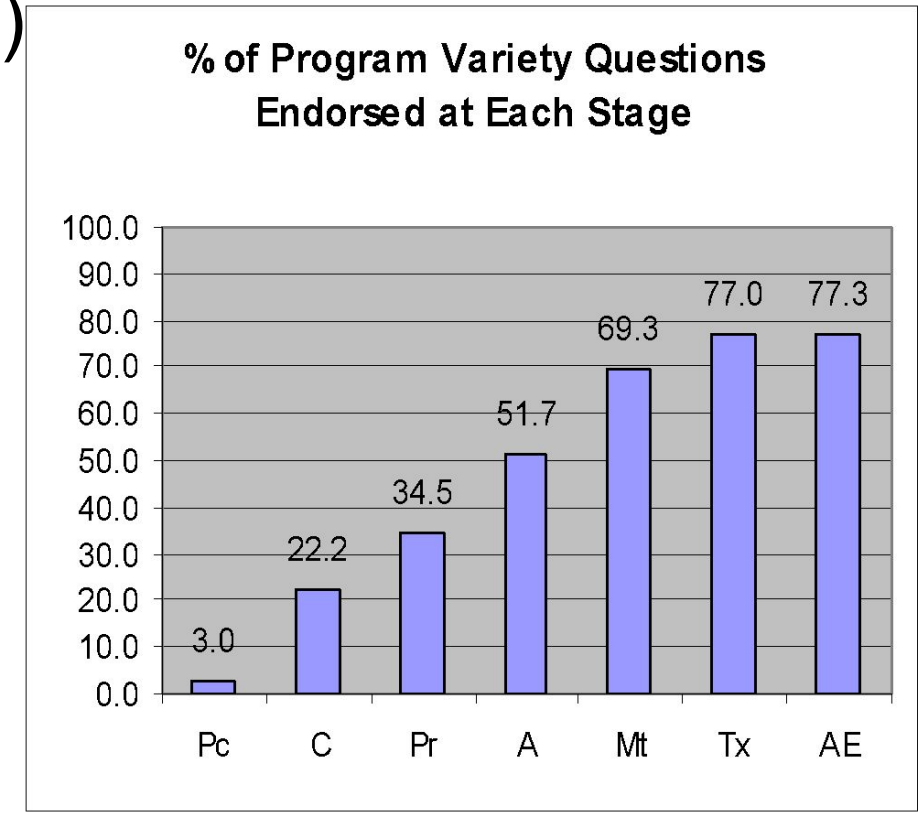


Figure 7

Move More

Graph #6:

Exercise Community Involvement ECI is the extent to which a person is involved with people, activities, contests, and events tied to their exercise activities.

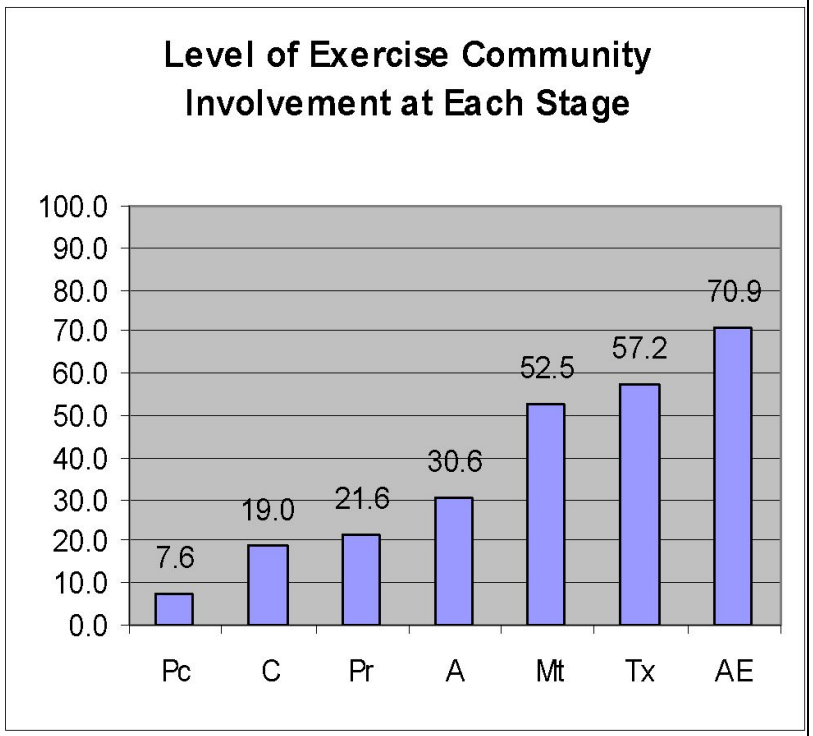


Figure 8

Move More

Success Clues:

1) Exercise at least **5 hours voluntary exercise/wk**
(burning at least 3000kcal in exercise/wk).

2) Perform at lest **50% of your exercise as high intensity**
(weights and interval exercise).

3) Keep exercise and nutrition records.

4) Set exercise and nutrition goals
(outcome and behavior goals).

5) Systematically rotate exercise program.

Week ___ Adherence	Meal 1	Meal 2	Meal 3	Meal 4	Meal 5	Meal 6	(Workout Drink)
Day 1							
Day 2							
Day 3							
Day 4							
Day 5							
Day 6							
Day 7							
Day 8							
Day 9							
Day 10							
Day 11							
Day 12							
Day 13							
Day 14							

Records

Week 1 Adherence	Meal 1	Meal 2	Meal 3	Meal 4	Meal 5	Meal 6	(Workout Drink)
Day 1 Training Day	X	X	X	X	*	X	X
Day 2 Non-Training Day	X	0	X	0	X	X	N/A
Day 3 Training Day	X	X	X	X	X	X	X
Day 4 Non-Training Day	X	X	X	0	X	X	N/A
Day 5 Training Day	X	X	X	X	X	X	X
Day 6 Training Day	X	X	X	0	X	*	X
Day 7 Non-Training Day	*	X	X	X	X	X	N/A

Tally up the total meals scheduled for the week (46 in this case) and subtract the boxes that either contain an O or contain a * (7 in this case). Once you have these numbers, assign a percentage-based adherence score.

For example, as this client missed 4 meals and “cheated” at 3 meals, they’ve achieved about 85% (39/46) adherence.

Monkeymen Calendar

Dec

				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

2006

JANUARY

Feb

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 New Year's	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16 M.L. King	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

To Do List

HELP OPTIONS Buy Now PRINT HIDE

Move More

Who has time for all that exercise?

National Human Activity Pattern Survey (n=8000):

Subjects watched TV for 170min/day (19.8h/week)

American Time Use Survey (n=50,000)

Subjects watched TV for 180min/day (21h/week)

Stop watching so much damn TV and do more exercise. See what happens…

A logical stepwise approach to fitness:

1) Get people moving more
2) Get them selecting better foods
3) Add exercise to promote NM adaptation
4) Begin to improve calorie balance
5) Begin to improve nutrient timing
6) Focus on maximizing G-Flux
    1) Optimized training loads, volume, intensities
    2) Optimized intake for activity and body type

Basic Nutrition

Start with food selection…

The Protein Chart	
Food Type:	Lean, Complete Protein Sources
Food Timing:	Eaten With Each Feeding Opportunity
Food Amount:	1 serving for women (size of palm) 2 servings for men (size of two palms)
Examples:	Lean meats (ground beef, chicken, turkey, bison, venison, etc.) Fish (salmon, tuna, cod, roughy, etc.) Eggs (egg whites, occasional whole eggs) Low Fat Dairy (cottage cheese, yogurt, part skim cheese, string cheese, etc.) Vegetarian Choices (tofu, tempeh, soy burgers, soy jerkey, soy sausage, soy bacon, seitan, etc.). Milk Protein Supplements (whey, casein, milk protein blends)

Basic Nutrition

The Carb Chart for Fat Loss				
Food Type:	Exercise Recovery Drink	Carbohydrate Simple Sugars and Highly Processed Starches	Carbohydrate While Grain Starchy Carbohydrates	Carbohydrate Fruits and Vegetables
Food Timing:	During Exercise Only*	Minimize Intake	Eat Soon (within 1-2 hours) After Exercise	Eaten With Each Feeding (with emphasis on veggies)
Examples:	Sugary, Protein-Rich Recovery Drinks including Biotest Surge, Endurox R4, etc. *If you tolerate carbs well, you can include such a drink during exercise. If you don't you should probably stick with water or a Branched Chain Amino Acid workout drink (to be discussed later in the course).	Sugary Sports Drinks Breakfast Cereals Soda Fruit Juice Table Sugar Sugary Desserts Ice Cream Muffins, bagels, and other carb-rich snacks	Bread (preferably whole grain) Pasta (preferably whole grain or flax) Rice (preferably whole grain, wild, unprocessed) Potatoes (preferably sweet potatoes or yams) Oats (preferably whole oats) Cereal Grains (wheat, rye, etc.)	Spinach Carrots Tomatoes Broccoli Cauliflower Apples Oranges Avocados Berries

Basic Nutrition

The Fat Chart			
Food Type:	Saturated Fat	Monounsaturated Fat	Polyunsaturated Fat
Food Timing:	None – just be sure to get about 1/3 of total fat intake from these fats	None – just be sure to get about 1/3 of total fat intake from these fats	None – just be sure to get about 1/3 of total fat intake from these fats, focusing on the omega 3 fats
Examples:	Animal Fats (fat in eggs, dairy, meats, butter, cheeses, etc.) Coconut Oil Palm Oil	Olive Oil Nuts and nut butters Avocado	Flax seeds/oil Fish oil Nuts and nut butters Vegetable oils

Basic Nutrition

Superfood Checklist	Sub-Category	Weekly Servings				
		1	2	3	4	5
Protein Foods						
Lean Red Meat (93% lean, top round, sirloin)	Protein – Lean Meat					
Salmon	Protein – Fish					
Omega 3 Eggs	Protein – Dairy					
Low-Fat, Plain Yogurt (lactose-free if you can find it)	Protein - Dairy					
Supplemental Protein (milk protein isolates, whey protein isolates, or rice protein isolates)	Protein - Powder					
Carbohydrate Foods						
Spinach	Carb - Vegetable					
Tomatoes	Carb - Vegetable					
Cruciferous Vegetables (Broccoli, Cabbage, Cauliflower)	Carb - Vegetable					
Mixed Berries (strawberries, blueberries, raspberries, etc.)	Carb - Fruit					
Oranges	Carb - Fruit					
Mixed Beans (kidney, navy, white, etc.)	Carb - Legume					
Quinoa	Carb – Grain					
Whole Oats (large flake)	Carb – Cereal					
Fat Foods						
Mixed Nuts (a variety of different types of nuts including pecans, walnuts, cashews, brazil nuts, etc.)	Fat – Seeds and Nuts					
Avocados	Fat - Fruit					
Olive Oil (extra virgin)	Fat – Oils					
Fish Oil (salmon, anchovy, menhaden, krill)	Fat - Oils					
Flax Seeds (ground)	Fat – Seeds and Nuts					
Liquid Drinks						
Green Tea	Teas					
Liquid Exercise Drinks (quickly digested carbohydrate and protein)	Recovery Drinks					

Basic Nutrition

“I eat really well…”
But…
“…I’m still 20lbs overweight.”

“My diet is perfect…”
But…
“…I often feel sluggish and low energy.”

“I make good nutritional choices…”
But…
“…I’ve got high BP, cholesterol, and type II diabetes.”

Basic Nutrition

What's the problem here?

Most people have no idea how they're doing (poor adherence either knowingly or unknowingly).

Food group servings: Perceived, average daily consumed, and recommended* by gender/age group

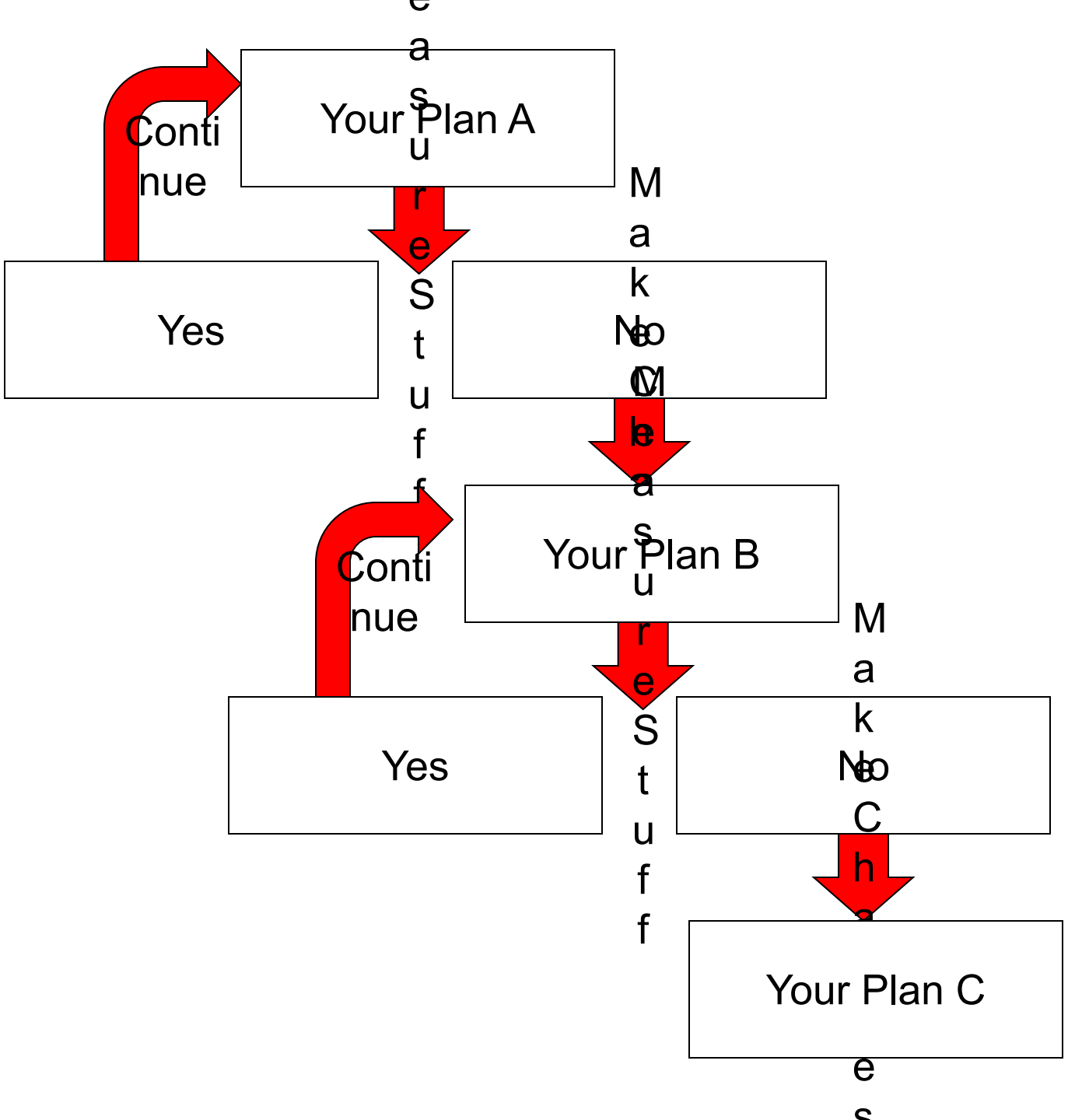
	Grains	Fruits	Vegetables	Milk	Meat, etc.	Other (fats, oils, and sweets)
Females 19-24						
Perceived	3.2	2.6	2.6	3.2	3.5	2.2
Consumed	4.2	0.8	1.7	1.2	1.6	3.0
Females 25-50						
Perceived	2.9	2.2	2.5	2.3	3.0	2.1
Consumed	4.6	0.8	2.0	1.0	1.7	3.2
Females 51 +						
Perceived	2.5	2.4	2.6	2.1	2.7	1.6
Consumed	4.7	1.5	2.2	1.0	1.7	3.1
Males19-24						
Perceived	2.9	2.1	2.2	3.1	3.7	2.1
Consumed	5.5	0.6	2.3	1.6	2.3	4.1
Males 25-50						
Perceived	2.9	2.2	2.4	2.2	3.4	2.1
Consumed	5.9	0.9	2.5	1.2	2.5	4.0
Males 51 +						
Perceived	2.7	2.2	2.5	2.1	3.1	1.7
Consumed	6.2	1.3	2.7	1.1	2.4	4.5

* *Recommended servings based on energy RDA for gender/age groups.*

Basic Nutrition

Even if they're doing what they think they should (good adherence), if they're not getting results, their program might need to improve.

I call this an outcome-based nutrition approach.


Your Plan A
Continue
Yes
Measure Stuff
Make No Change
Your Plan B
Continue
Yes
Measure Stuff
Make No Change
Your Plan C

…Time for a break…

A logical stepwise approach to fitness:

1) Get people moving more
2) Get them selecting better foods
3) Add exercise to promote adaptation
4) Begin to improve calorie balance
5) Begin to improve nutrient timing
6) Focus on maximizing G-Flux
    1) Optimized training loads, volume, intensities
    2) Optimized intake for activity and body type

More Advanced Principles

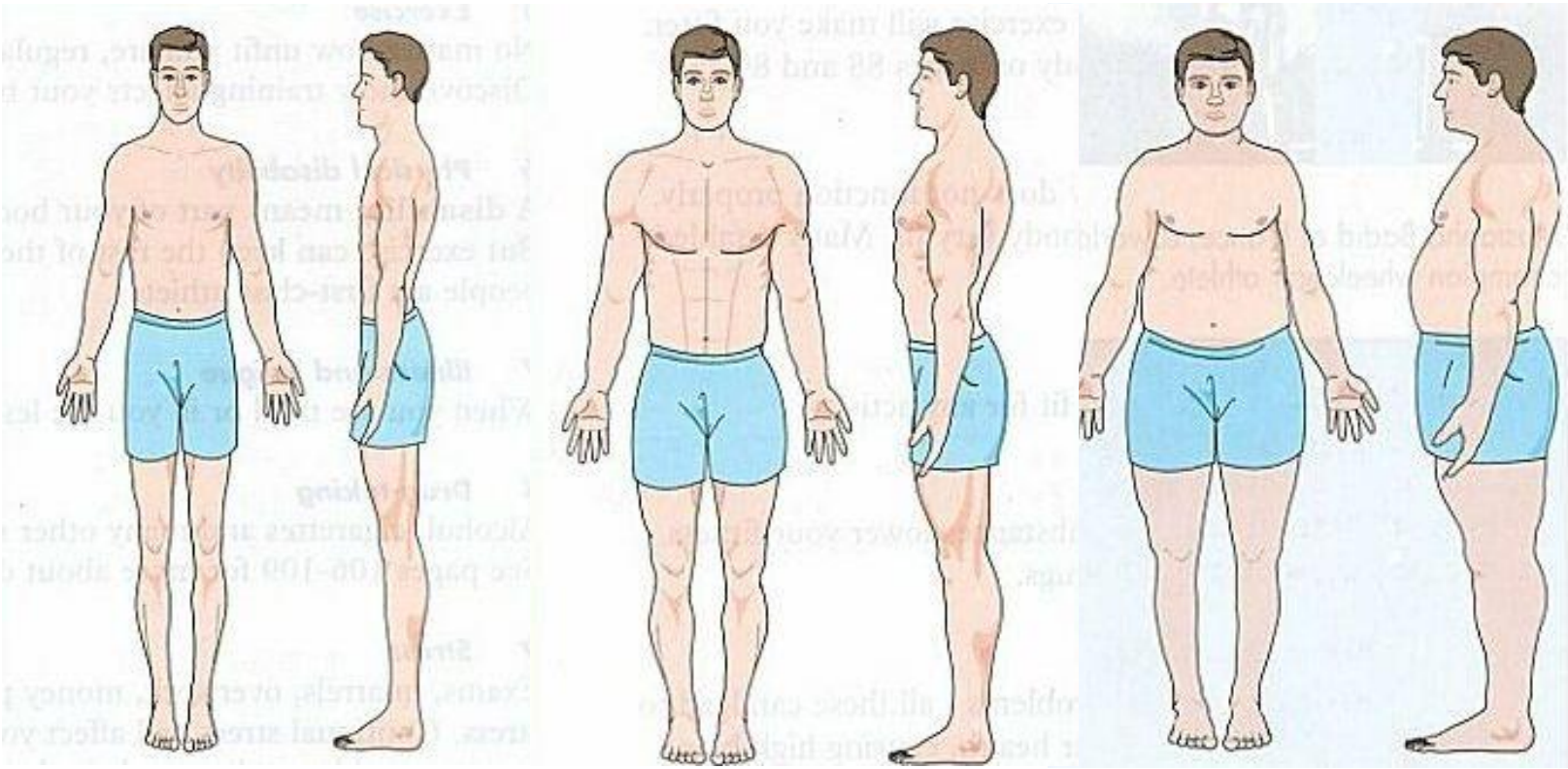
Individualization By Body Type

Using somatotype categories to determine training/nutritional optimization.

Currently working on equations using regional skinfolds and muscle fiber types to refine somatotype vagaries.

Body Type Individualization

Three Body Types



Experiences?

Body Type Individualization

Ectomorphic

Physiology:

Hyperactive sympathetic nervous systems and thyroid hormone output.

Energy Balance Considerations:

High SNS and thyroid output leads to high amounts of non-exercise energy expenditure (RMR, TEF, SPA).

High SNS also leads to reduced digestive activity and lower appetite.

Body Type Individualization

Mesomorphic

Physiology:
High anabolic hormone concentrations.

Energy Balance Considerations:

High anabolic hormone concentrations increase tissue turnover and protein synthesis, keeping energy expenditure high yet not as high as the ectomorph.

High anabolic hormone concentrations increase appetite.

Body Type Individualization

Endomorphic

Physiology:
High insulin output and low SNS activity.

Energy Balance Considerations:
Low SNS activity leads to low amounts of non-exercise energy expenditure (RMR, TEF, SPA).

Low SNS activity is correlated with increased appetite.

More Advanced Movement

Ideas For Overall Program Design

3 types of exercise that should be in your program:

1) Strength training
2) Interval training
3) Cardio training

Example by Body Type	Ectomorph 4hr/wk	Mesomorph 5-6hr/wk	Endomorph 7-8hr/wk
Strength	3 hours/wk	4 hours/wk	4 hours/wk
Interval	30 min/wk	30 min/wk	1.5 hour/wk
Cardio	30 min/wk	1 hour/wk	2 hours/wk

More Advanced Movement

Strength training:

Should create muscle damage and CNS challenge/fatigue. And this is where the benefit comes in as the body adapts with increased muscle mass and strength. Further, the repair process in calorie expensive, leading to an 5-10% increase in metabolic rate that lasts for 24+ hours.

Interval training:

Should create high energy demand as well as depletion of stored substrate. (It also contributes to CNS challenge/fatigue). The benefits of this exercise come after the exercise session as the body dumps large amounts of triglycerides post exercise, uses a lot of calories to replenish stored substrate, and elevates metabolism over the following 12-24h.

Cardio training:

Should burn calories while exercising to "top off" G-Flux expenditure. Further, can help with recovery of muscle damage and CNS fatigue. This exercise does not increase 24 hour calorie burning and alone is ineffective in creating body transformation.

More Advanced Movement

Intervals vs. Cardio Debate

*Tremblay compared aerobic vs. sprint exercise and the sprint group lost 3x more fat while expending ½ the calories.

*Mougios compared high and low intensity programs and found no significant difference in fat loss, but the low intensity group lost lean mass. (long term a reduction in lean mass would lead to a reduction in RMR and thus reduce future fat loss).

*Utter showed that the addition of 45 minutes of aerobic exercise at 78% MHR 5 days a week for 12 weeks had NO EFFECT over dieting alone.

*Van Dale showed that the addition of 4 hours of aerobic exercise per week had no effect on weight loss.

*Gleim showed that "(Aerobic) Exercise is not an effective weight loss modality in women."

More Advanced Movement

Intervals vs. Cardio Debate

Trapp EG and Boutcher examined the effects of three bouts per week of HIIE on fat loss among sedentary young women.

Mean change for the HIIE group -1.51 ± 3.6 kg fat ; -2.5 ± 2.6 %body fat

Mean change for the SS group -0.1 ± 2.3 kg fat ; -0.4 ± 2.1 %body fat

Conclusions: Twenty minute of HIIE, three times a week for 15 weeks led to significantly greater fat loss compared to steady state exercise.

More Advanced Movement

What's a better strategy?

More Advanced Movement

Do no cardio?

Absolutely not! Cardio is an effective calorie burning modality – but not to be done alone and not to be done as one's only exercise.

However, when included in a program that focuses on proper eating, smart muscle-building weight training, and fat burning intervals, cardio can help:

1) Top up G-Flux
2) Improve recovery of CNS

More Advanced Movement

1) Build the muscle needed to speed up metabolism
   -Strength and muscle-building training

2) Create the muscle damage needed to speed up metabolism
   -Strength and muscle-building training

3) Maximize the post workout after burn
   -Substrate depletion training (intervals) and muscle-damage training

4) Encourage your body to waste calories through regular program change
   -Vary your program and use regular progression indices

5) Boost the number of calories you burn through movement
   -Top off your G-flux with other exercise

More Advanced Movement

Strength Training Suggestions

Use strength training for building muscle and strength – not for “cardio”, “intervals”, or “weight loss.”

Guidelines

*2-5 sessions per week of about 1h in duration

*Begin with dynamic warm-up

*Strive for anterior/posterior; internal/external, flexion/extension balance in ex. selection unless massive imbalance exists

*Rep range <8 unless it’s a warm-up or exerciser is a beginner

*Explosive concentric (tension), controlled eccentric (damage)

*Everything else is preference, fine-tuning, and individualization

More Advanced Movement

Interval Training Suggestions

Use interval training for high intensity calorie burning work.

Guidelines

*1-3 sessions per week

*Bodybuilders, to maximize muscle fullness, should minimize

*Begin with 20 minutes and work up to max of 45

*Mix modalities and work: rest intervals

*Suggested work: rest – 30on-90off; 60on-120off; 90on-90off

*Make sure “on” intervals are done at VERY HIGH intensity

*Make sure “off” intervals are done at VERY LOW intensity

*Select a work intensity that allows consistent effort thru full workout; therefore first few sets should be less than max

More Advanced Movement

Interval Demonstration

http://www.youtube.com/watch?v=uFX05rZGRUg

http://www.youtube.com/watch?v=Zxo9kLcWSEA

More Advanced Movement

Cardio Training Suggestions

Use cardio training to top-off G-flux and to promote CNS recovery

Guidelines

*1-3 sessions per week

*Done at moderate intensity (60-70% HR Max)

*More than 30 minutes is best

*Steady state is good but all forms of “play” are acceptable

*Have fun with this as it doesn’t have to be done at a gym

More Advanced Movement

Exercise Scheduling

Daily exercise (or as close to it as possible) is likely best vs. lots of exercise done on 3-4 days.

Try to alternate high intensity and low intensity/rest days if possible.

However, when scheduling your program, just get all the exercise done. If you have to miss Monday, do that workout on Tuesday.

…Time for a break…

A logical stepwise approach to fitness:

1) Get people moving more
2) Get them selecting better foods
3) Add exercise to promote adaptation
4) Begin to improve calorie balance
5) Begin to improve nutrient timing
6) Focus on maximizing G-Flux
    1) Optimized training loads, volume, intensities
    2) Optimized intake for activity and body type

Precision Nutrition

Targeting Calorie Balance and Nutrient Timing

- Eat every 2-3 hours
- Include lean, complete protein at every meal and snack
  - (Men 2 portions, Women 1 portion)
  - (Portion = size of palm)
- Include vegetables at every meal and snack
  - (1-2 Portions per meal)
  - (Portion = 1 fruit, ½ cup chopped F&V, 1 cup leafy)
- Consume carbohydrate-rich foods only after exercise
  - (Primarily with fat loss goals)
- Include a variety of healthy fats in your diet every day

Eating Frequency

Regular feeding intervals:

- Stimulate metabolism
- Balance blood sugar
- Maintain lean mass
- Reduce stress hormone production
- Manage insulin response to meals
- Decrease body fat

Eating Frequency

Problem Solving

1) How many meals a day should I be eating?
2) Should I eat before bed, before exercise, etc?
3) How big should these meals be?
4) Does this mean 3 meals and 2-3 snacks per day?
5) What happens if I miss a meal?

Protein Intake

Shift toward more dietary protein:

Protein is the most thermogenic nutrient, with a 30% TEF vs. 6% for dietary carbohydrate and 3% for dietary fat.

By eating 1 (women; 20-30g) – 2 portions (men; 40-60g) with each meal, you're more likely to meet daily protein needs of about 1g/lb (sometimes less sometimes more).

This is primarily a pragmatic recommendation although there are some physiological benefits too.

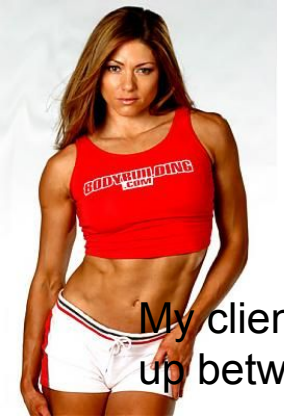
Protein Shift

Meal 1A:	Meal 1B:
20g protein, 60g carbs, 20g fat Energy in = 500kcal Energy out = 43.8kcal	**60g protein, 20g carbs, 20g fat** Energy in = 500kcal Energy out = 82.2kcal

Over the course of 6 daily feedings, this simple shift would increase energy expenditure by 230 kcal/day.

Cumulatively, things like a higher protein intake (+230kcal/day), fish oil supplementation (+300-400kcal/day), increased post-exercise energy cost (+75-175kcal/day), higher G-Flux (+150-250kcal/day), and even chewing gum (+11 kcal/hour) can make a difference.

Therefore it's possible to improve body comp by activating all these G-Flux boosting measures -- you can expect -- improved tissue turnover, remodeling, recovery, nutrient partitioning, SNS activation, and body composition (increased LBM, decreased FM) – while making it very hard to "overeat."



Protein Confusion

My clients typically aim for 25-50% of their dietary energy from protein. This usually ends up between 1g/lb to 2.5g/lb. % protein intakes are individual (to be discussed later).

180lb male	Fixed Protein Intake 1g/lb protein	Variable 1g/lb protein	Variable 1.5g/lb protein	Variable 2g/lb protein	Variable 2.25g/lb protein
1800kcal	40% protein 60% f&c	40% protein 60% f&c			
3400kcal	21% protein 79% f&c		32% protein 68% f&c		
5000kcal	14% protein 86% f&c			29% protein 71% f&c	
8000kcal	9% protein 91% f&c				20% protein 80% f&c

It is 100% stupid to either use % alone or g/lb to determine protien intake independently of a discussion of the entire diet.

Fruits and Vegetables

What does 10 servings look like?

1 apple, 1/2c. pineapple, 1c. frozen berries,

1c.spinach, 1 tomato, 1 avocado, ½ cup of green peppers, ½ cup of red peppers, ½ cup onion, ½ cup mushrooms

Carb Timing

Carbohydrate timing and individualization:

- For fat loss, earn higher carb meals by exercising first
- When you do earn them stick with whole grain, unprocessed varieties

Caveat

- For carb-dependent sports and those interested in muscle gain, more carbs may be included

More on this to come…

Fat Intake

There is a wide range of potential fat intake (15-60%) and it's based on carb intake. An average, healthy intake would be 30%

Goals would be 1/3 of each type of fat (mono, poly, sat) and 2:1 or 1:1 omega 6 to omega 3.

Fat Intake

The simplest way to fix fat intake:

In addition to the fat you normally get from your food selections, chose the following each day:

Fish Oil (6-10g/day)
Flax Oil (1 tbsp/day; unheated)
Olive Oil (1-2 tbsp/day; unheated)
Mixed Nuts (1/2 cup/day)
Ground Flax Seeds (2-4 tbsp/day)
1 Avocado
Coconut Oil or Butter (1-2 tbsp/day for cooking)

Cheat Sheet

Cheat Sheet

Answer each question according to the 5 Habits

1. **When did you last eat?**

If it's been longer than 2-4 hours, it's time to eat.

2. **Where is the complete protein?**

Are you about to eat at least 1 serving (20-30g) of complete protein? If not, find some protein. Women get 1 serving and men get 2.

3. **Where are the veggies?**

Are you about to eat at least 2 servings of veggies? Prepare them anyway you like, but eat them with every meal or snack. (One serving is about 1/2 – 1 cup and your target is 5-10 cups per day).

4. **Where are the carbs?**

If you have fat to lose but haven't just worked out, put down the pasta, bread, rice, and other starchy carbs in favor of a double serving of fruits and veggies. If you have just worked out, a mix of carb sources is fine.

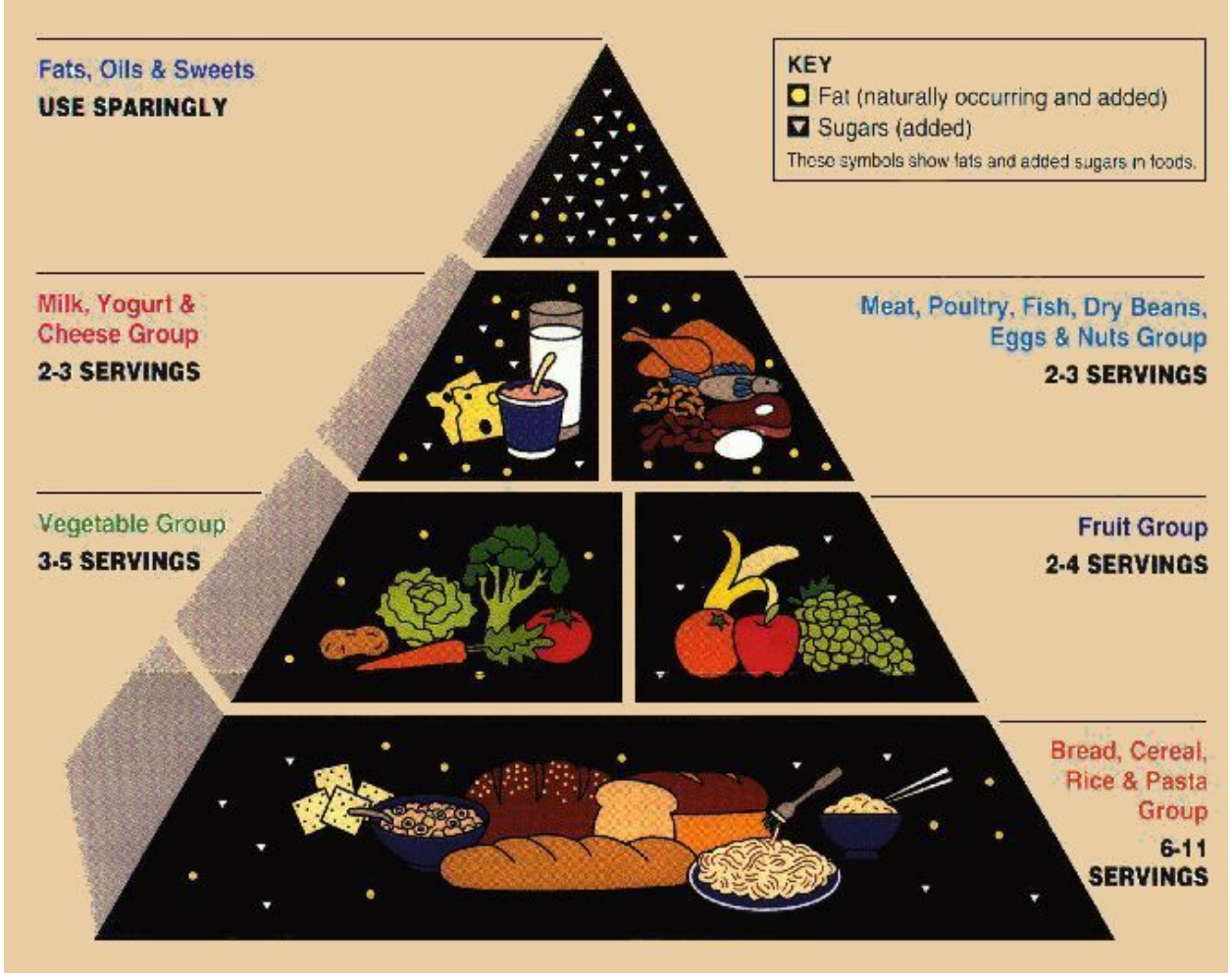
5. **Where are your fats coming from?**

Today you need some fat from animal foods, from olive oil, from mixed nuts, and from flaxseeds/flaxseed oil. Spread them throughout the day but make sure to add them in.

Proteins	Carbohydrates			Fats		
Lean, Complete Proteins	Simple Sugars	Starchy Carbohydrates	Fruits and Vegetables	Saturated Fats	Monounsaturated Fats	Polyunsaturated Fats
Eaten With Each Feeding Opportunity	Eaten Only During and After Exercise (if at all)	Eaten Mostly After Exercise	Eaten With Each Feeding	About 30% of Fat Intake	About 30% of Fat Intake	About 30% of Fat Intake
Lean meats (ground beef, chicken, turkey, etc.) Fish (salmon, tuna, etc.) Eggs (Egg Whites) Low Fat Dairy (cottage cheese, yoghurt) Milk Protein Supplements (Whey, Casein, Milk Protein Blends) Etc	Soda Fruit Juice Table Sugar Sports Drinks Breakfast Cereal (some varieties) Etc.	Bread Pasta Rice Potatoes Oats Cereal Grains wheat, rye, etc) Etc.	Spinach Carrots Tomatoes Broccoli Cauliflower Apples Oranges Avocados Berries Etc.	Animal Fats (fat in eggs, dairy, meats, butter, etc.) Coconut Oil Palm Oil Etc.	Olive Oil Nuts Avocado Etc.	Vegetable Fats Flax seeds/oil Fish oil Etc.

Table 3: Some examples of foods in each food category discussed in the 10 habits. For more foods and their macronutrient and macronutrient composition, visit the USDA Nutrient Database online at http://www.nal.usda.gov/fnic/foodcomp/search/

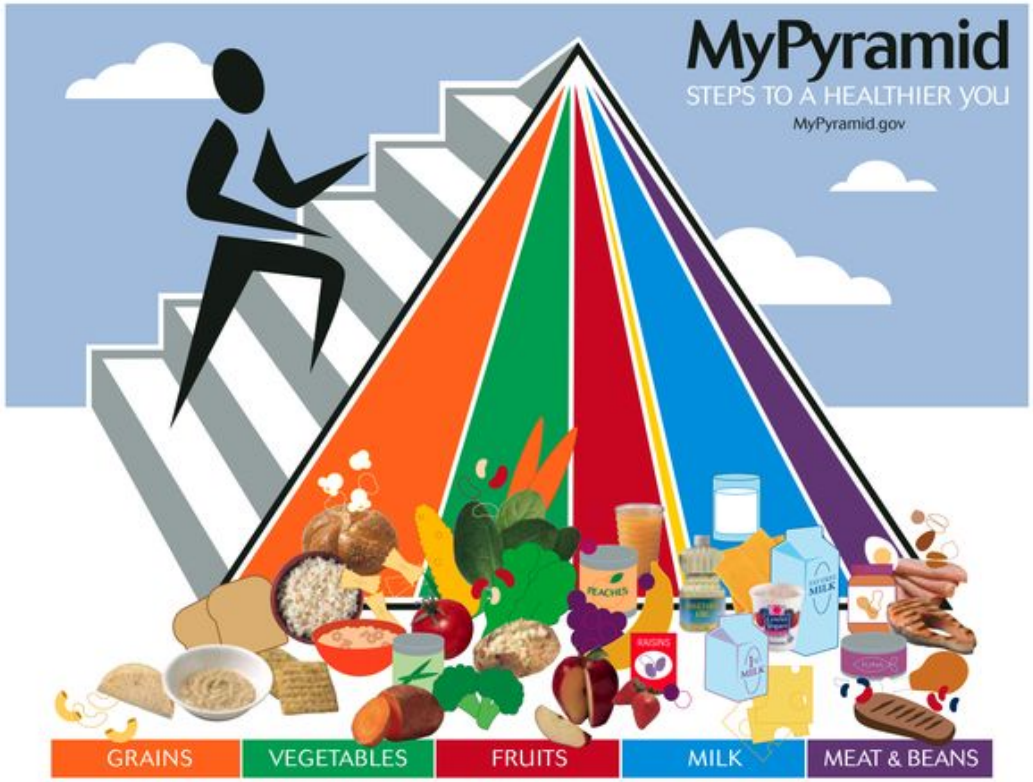
The Old Food Pyramid



Problems:

Carbs – good
Fats – bad
Dairy – too much

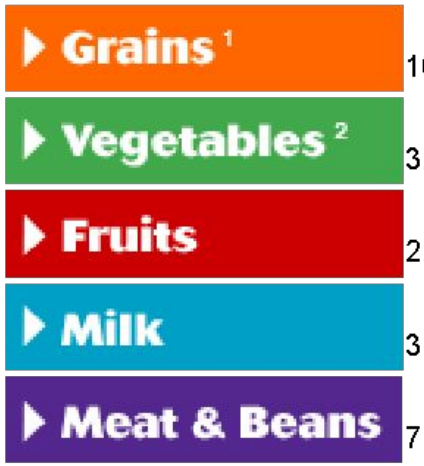
The New Food Pyramid



Much Better!

Grains	Vegetables	Fruits	Milk	Oils	Meat and Beans
8 oz/4 servings	3 cups	2 cups	3 cups	7 teaspoons	6.5 oz

Example Recommendations Based on USDA Food Pyramid for 25 Year Old Male (6'0", 180lbs)



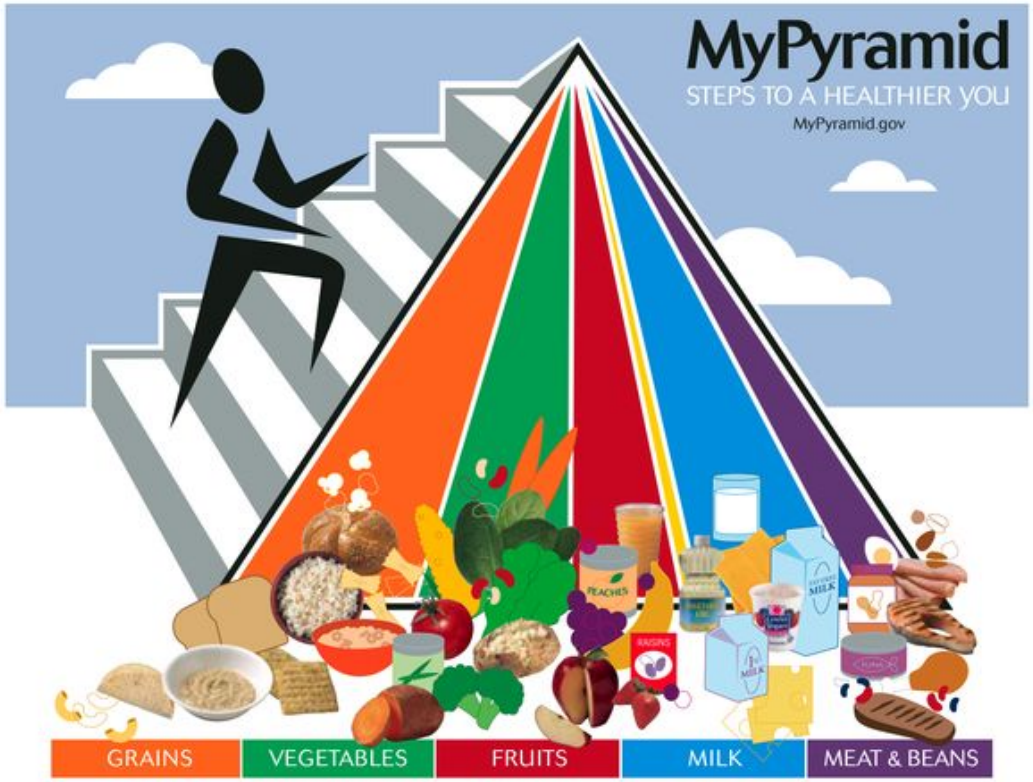
Eat these amounts from each food group daily. This plan is a 2800 calorie food pattern. It is based on average needs for someone like you. (A 25 year old male, 6 feet 0 inches tall, 180 pounds, physically active less than 30 minutes a day.) Your calorie needs may be more or less than the average, so check your weight regularly. If you see unwanted weight gain or loss, adjust the amount you are eating.

[1] Make Half Your Grains Whole
Aim for at least 5 whole grains a day

[2] Vary Your Veggies
Aim for this much every week:
Dark Green Vegetables = 3 cups weekly
Orange Vegetables = 2 ½ cups weekly
Dry Beans & Peas = 3 ½ cups weekly
Starchy Vegetables = 7 cups weekly
Other Vegetables = 8 ½ cups weekly

Oils & Discretionary Calories
Aim for 8 teaspoons of oils a day
Limit your extras (extra fats & sugars) to 425 Calories

The New Food Pyramid



Problems

Based on 15-20%P, 50-55%C, 25-30%F

Protein may be too low

Still too much dairy

No nutrient timing

Nutritional Individualization

The habits previously discussed are good for Level 1 and 2 clients. However, Level 3 clients may need a higher level of individualization.

Nutritional Level	Description of Level	Typical Characteristics of Level	Approach
Level 1	Sedentary individuals or individuals with exercise experience who are completely new to eating well	**Body Comp. Assessment** reveals high body fat % (<18% men; <25% women) **Kitchen Questionnaire** reveals poor kitchen set-up. **Client Information Sheet** reveals poor grocery shopping habits. **3-Day Food Record** reveals little knowledge of correct food type, timing, and amount.	This type of client requires a slow coaching approach focused on: Basic food education and basic habit development - from basic food selection lessons to grocery shopping strategies to better meal planning and preparation. Beginning by making some general food suggestions while teaching the client the structure required to support healthy eating.
Level 2	Sedentary individuals or individuals with exercise experience who demonstrate some understanding of good nutrition yet need guidance, planning, and direction	**Body Comp. Assessment** reveals moderate body fat % (<18% men; <25% women) **Kitchen Questionnaire** reveals average kitchen set-up. **Client Information Sheet** reveals average grocery shopping habits. **3-Day Food Record** reveals above average knowledge of correct food type but average to below average knowledge of food amount or timing.	This type of client usually has the basics down in terms of food selection. They may do well at the grocery store and may have no issues with food preparation. However, this type of client typically needs to learn more about moderating overall calorie intake, establishing correct portion sizes for their body type, and eating the right foods at the right times of the day. General strategies may work well here although more specific ideas may also have to be introduced.
Level 3	Sedentary individuals or individuals with exercise experience who eat the right foods in the right amounts at the right times	**Body Comp. Assessment** reveals low body fat % (<12% men; <20% women) **Kitchen Questionnaire** reveals excellent kitchen set-up. **Client Information Sheet** reveals excellent grocery shopping habits. **3-Day Food Record** reveals above average knowledge of correct food type, amount, and timing. These individuals are typically already lean yet want to go the next step toward optimization.	This type of client likely already has a good understanding of the principles of eating the right foods at the right times in the right amounts. They may also have excellent shopping and preparation strategies. However, they may need very specific calorie and macronutrient information. And beyond establishing a baseline diet, they'll also need specific strategies for making outcome-based dietary decisions.

Nutritional Individualization

The habits previously discussed are good for Level 1 and 2 clients. However, Level 3 clients may need a higher level of individualization.

At level 3, begin with calorie calculations.

Calorie Estimator			
	Your Goal - Weight Loss	**Your Goal - Weight Maintenance**	**Your Goal – Weight Gain**
Sedentary (minimal exercise)	Body weight (lbs) x 10-12	Body weight (lbs) x 12-14	Body weight (lbs) x 16-18
Moderately Active (3-4 times/wk)	Body weight (lbs) x 12-14	Body weight (lbs) x 14-16	Body weight (lbs) x 18-20
Very Active (5-7 times/wk)	Body weight (lbs) x 14-16	Body weight (lbs) x 16-18	Body weight (lbs) x 20-22

Nutritional Individualization

Determine macronutrient recommendations

Body Type and Macronutrient Estimates					
Somatotype & Physical Activity Preference	**Characteristics**	**Typical Goals**	**Example/Average Starting % Protein**	**Example/Average Starting % Carbohydrate**	**Example/Average Starting % Fat**
Ectomorphic **-Naturally Thin w/ Skinny Limbs** **–Endurance Exercise**	Thyroid dominant, fast metabolic rate, high sympathetic nervous system activity, higher carbohydrate tolerance.	Gain muscle strength and size, especially in limbs. Maintain body weight and strength during high volume/endurance exercise.	Approximately 25% protein	Approximately 55% carbohydrate	Approximately 20% fat
Mesomorphic **- Naturally Muscular & Athletic** **-Bodybuilding /Relative Strength Exercise**	Testosterone and growth hormone dominant, moderate carbohydrate tolerance, moderate to high sympathetic nervous system activity.	Continue to build muscle mass while maintaining low body fat %. Support athletic performance.	Approximately 30% protein	Approximately 40% carbohydrate	Approximately 30% fat
Endomorphic **-Naturally Broad and Thick** **-Absolute Strength Exercise**	Insulin dominant, slow metabolic rate, low sympathetic nervous system activity, low carbohydrate tolerance.	Lose body fat, especially in central region (abdominal, lower back).	Approximately 35% protein	Approximately 25% carbohydrate	Approximately 40% fat

Body Type Individualization

Ectomorph Notes:

Exercise and Recovery:

Require lots of pure rest & recovery time (yoga, meditation, etc). May require regular CNS recovery supplementation

Feeding:

Usually under eat during ad-libitum conditions and require force-feeding until they adapt to new, higher intake.

Should eat carbs throughout the day (low GI if possible) – although highest carb meals (high GI) should come during/post-exercise.

Do best on higher calorie and carbohydrate intakes (25%P; 55%C; 20%F)

Body Type Individualization

Mesomorph Notes

Feeding:
Usually don't need to count calories as they respond fairly well to ad libitum eating conditions.

Do well to ingest low GI breakfast carbs along with higher carb (high GI) workout and post-exercise meals. Fewer carbs during the rest of the day.

Do best on a mixed nutritional intake
(30%P; 40%C; 30%F)

Body Type Individualization

Endomorphic

Exercise:
Require higher exercise volume than other types

Feeding:

Don't always over eat relative to energy expenditure but do have poor nutrient partitioning.

Limit carbs to during exercise (if at all) and maybe some low GI, high fiber carbs within 1-2 hours post exercise. The rest of the carbs should come from veggies w/ small amount of fruit.

(35%P; 25%C; 40%F)

Nutritional Individualization

Determine nutrient timing

Carbohydrate Tolerance*	Typical Goal For This Type of Individual	Typical Body Type	Typical Activity if an Athlete	Carbohydrate Timing Rules
Excellent Carbohydrate Tolerance	Gain Muscle or Improve Endurance Performance	Ectomorph	Endurance Activity	Should include sugary carbs during/after each exercise session. Some starchy, whole grain, unprocessed carbs can be eaten at each other meal. Veggies and fruits (3:1 serving ratio) should be eaten at each meal.
Moderate Carbohydrate Tolerance	Gain Muscle/Lose Fat or Improve Sport Performance	Mesomorph	Intermittent Sport Athlete	Can include sugary carbs only during/after exercise. Starchy, whole grain, unprocessed carbs can also be eaten at breakfast and post exercise. They can be used *in moderation* during the rest of the day. Veggies and fruits (4:1 serving ratio) should be eaten at each meal.
Poor Carbohydrate Tolerance	Fat Loss	Endomorph	Strength and Power Athlete	All starchy/sugary carbs should be included only during/after exercise. Veggies and fruits (5:1 serving ratio) should be eaten at each additional meal.

Nutritional Individualization

The USDA Food Database
http://www.nal.usda.gov/fnic/foodcomp/search/

Nutrition Data
http://www.nutritiondata.com/

…Time for a break…

Special Cases

Very low calorie diets

-extreme levels of leanness with maximal muscle mass

Very low carb diets

-extreme levels of leanness with maximal muscle mass

Calorie cycling

-necessary if using either above

-3 ways to cycle for fat loss

-cycling for muscle gain

Very high carb diets

-endurance athletes prior to events

Special Cases

Very low calorie diets

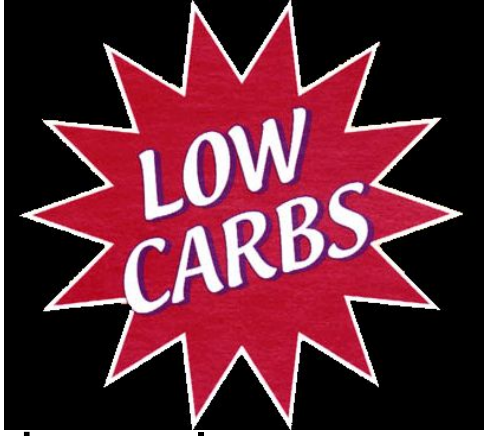
1) Get exercise in the 5-7 hours per week range
2) Decrease calorie intake
3) Increase exercise volume to 7-9 hours
4) Decrease calorie intake

May end up at 7-10 hrs/wk exercise and less than 10kcal/lb.
Do not exceed 3-4 months of this at a time.

Best practices:

Decrease feeding frequency to 3-4 meals/day, keep veggie intake high, maintain 1g/lb protein, add multi-vitamin, use green food, use BCAA between meals, improve sleep with (ZMA, 300-600mg of Phosphatidylserine, and 200-400mg of Valerian before bed).

Special Cases



Very low carb diets

Similar to low calorie diets yet carbs will make up less than 20% of intake, protein will remain at 1g/lb, and fat will make up the rest.

Special Cases

Calorie/carb cycling

Dieting decreases metabolic rate, thyroid hormone output, SNS activity, SPA, reproductive hormone output, etc. Cycling tricks the body by preventing "starvation mode"

3 Re-Feed Methods

1) Infrequent, Big (7-14 days; 3-3.5x intake)
2) Frequent, Moderate (3-4 days; 1-1.5 intake)
3) Strategic Cycling

Menu 1	Menu 2	Menu 3	Menu 4
~1000kcal 150g protein 33g carbs 30g fat	~1250kcal 150g protein ***95g carbs*** 30g fat	~1500kcal 150g protein ***125g carbs*** ***45g fat***	~1500kcal 150g protein 33g carbs ***85g fat***

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Menu 1	Menu 1	Menu 4	Menu 2	Menu 1	Menu 1	Menu 3

Special Cases

Calorie/carb cycling

For muscle gain

Menu 1 **80% of Carb Intake**	**Menu 2** **Estimated Intake Needs**	**Menu 3** **120% of Carb Intake**
3212kcal 262g protein 280g carbohydrate 116g fat	3500kcal 262g protein 350g carbohydrate 116g fat	3772kcal 262g protein 420g carbohydrate 116g fat

Special Cases

Very high carb diets

Elite endurance athletes wanting to maximize glycogen prior to a competition.

During Training Periods			
Calories	**Carbohydrate Intake**	**Protein Intake**	**Fat Intake**
Bodyweight x 20-22	55% of total calories	25% of total calories	20% of total calories

3-4 Days Prior to Competition			
Calories	**Carbohydrate Intake**	**Protein Intake**	**Fat Intake**
Bodyweight x 20-22	70% of total calories	15% of total calories	15% of total calories

…Time for a break…

Types of Supplements

Essential Nutrients

Targeted Molecules

The non-supplement supplements:

Proteins, Fats, Carbs,
Vitamins, Minerals

Can be used by everyone based on dietary needs, etc.

The supplement, supplements:

Acid Buffers, Creatine,
CNS Stimulants, etc

Used only in specific physiological Situations based on special needs

Questions To Ask

Important questions to ask:

What are the chances my diet is deficient in the essential nutrients I want to supplement with?

Which physiological system do I hope to target with this supplement?

Is there objective research demonstrating real benefit and safety?

Questions To Ask

First priority:
Eat better

Next step:
Supplement on “bad days”

Essential Nutrient Supplements For Regular or Occasional Use			
Supplement	**Food Equivalent**	**Frequency of Supplement Use**	**When to Use**
Protein Supplement (Preferably a milk protein blend; although egg, rice, or soy protein supplements will work)	Any complete protein source including lean meat, lean dairy, egg whites, etc.	Depends on whole food protein intake. If protein needs are met with whole food protein, supplement use will be infrequent. If protein needs are not met, supplement use will be more frequent.	Use when a whole food protein choice is recommended but inaccessible.
Fish Oil Supplement (High omega-3 content; should contain at least 30% EPA and DHA)	Fatty fish such as salmon, anchovy, or sardine.	As much of the available whole-food fish supply contains environmental pollutants. As a result, fish oil supplements should likely be taken every day while your clients reduce their fish intake to "occasional."	With meals, daily. Recommended dose is 2-3g of total omega-3 rich fish oil per day.
Greens Supplement (Green food blend high in antioxidants, strongly alkaline, and vitamin/mineral rich)	Vegetables, fruits	Depends on fruit and vegetable intake. If veggie and fruit intake is high (up to 10 servings/day), supplement use will be infrequent. If veggie and fruit intake is low, supplement use will be more frequent.	Use when a veggie or fruit choice is recommended but inaccessible.
Multi-Vitamin/ Multi-Mineral	Varied diet	As many North Americans are marginally deficient in several micronutrients, unless a client is very conscientious about their diet, multi-vitamins/multi-minerals should be taken every day.	With meals, daily, on days where dietary intake is poor.
Protein-Carbohydrate (P+C) Drink (Should contain a mixture of fast-digesting, well-tolerated protein and carbohydrate in a ratio of 2:1 or 3:1 carbs:protein)	Any protein and carbohydrate-rich food	During all high intensity exercise sessions when muscle strength increases and size increases, as well as athletic performance increases, are desired.	During workouts only
Branched Chain Amino Acids (Should contain the 3 BCAA; leucine, isoleucine, valine)	Any protein-rich food	During all high intensity exercise sessions when fat loss and muscle/performance preservation is desired.	During workouts only

Questions To Ask

Which physiological system do I hope to target with this supplement?

Non-Essential Nutrient Supplements For Regular or Occasional Use				
Specific Use	**Supplement**	**Frequency of Use**	**Dose**	**Notes**
To improve insulin sensitivity and reduce insulin response to meals in those with poor carbohydrate tolerance and fat loss goals	R-Alpha Lipoic Acid	Daily	100mg per day	Be sure to choose the "R" form as this non-r forms are less effective.
To help reduce CNS fatigue and/or symptoms of sympathetic nervous system overreaching during high intensity and/or high volume exercise phases	Tyrosine and Phosphatidylcholine	Daily during high volume training phases	2000-3000mg Tyrosine and 1000mg Choline post-[illegible]	These can be taken before training to enhance neural drive as well although do not exceed the [illegible] dose.
To improve CNS output prior to competition	Caffeine	Prior to athletic events only	250-500 mg within 60 minutes of competition	Some athletes do not tolerate caffeine well so a trail run outside of competition should be conducted to assess tolerance.
To buffer hydrogen ions and acidity during high lactate activity	Sodium Bicarbonate Sodium Citrate	60-90 minutes prior to events that produce high lactate concentrations	20-30 g in 1L water	Some athletes do not tolerate either supplement well so a trail run outside of competition should be conducted to assess tolerance.
To buffer hydrogen ions and acidity during high lactate activity	Beta Alanine	Daily during periods of high lactate training	1000mg 3x per day	At this dose, beta alanine may cause "flushing" (tingling) of the skin. This is not harmful.
To help regenerate ATP during ATP-PC dependent strength and power activity	Creatine	Daily during periods of high intensity strength/power training	5000mg 1x per day	Loading doses higher than 5 g daily are not necessary.
To stimulate the metabolism during weight loss phases	Green Tea Extract	Daily during fat loss periods	400mg 1-2x per day	Be sure your green tea extract is high in ECGC, the most active component.
To stimulate the metabolism, induce apoptosis of fat cells, and down-regulate leptin during weight loss phases	CLA	Daily during fat loss periods	2.5-5 g CLA daily	Can be taken in a single dose or divided doses.
To improve sleep quality during high volume exercise or low food intake conditions	Valerian Root	During periods of negative energy balance and poor sleep	400mg about 60 min before bed	Choose the extract vs. the dried root.

Simple Supplementation

The Super Shake

- 1 cup iced green tea
- 3 tbsp plain yogurt
- 1 serving Greens+
- 2 scoops vanilla milk protein blend
- 1/2 cup frozen berries
- 1 tsp fish oil
- Options (3 tbsp ground flax seeds, mixed nuts, and or oats)

Questions To Ask

Is there objective research demonstrating real benefit and safety?

Example: Creatine

A review of over 500 studies evaluating effects on muscle physiology and/or exercise capacity. 300 have evaluated performance value and 70% showed positive results.

Of these, very few showed any negative effects.

www.pubmed.com

Athletes?

IOC Sports Nutrition Consensus (2003)

- "The amount, composition and timing of food intake can profoundly affect sports performance. Good nutritional practice will help athletes train hard, recover quickly and adapt more effectively with less risk of illness and injury."

- "The right diet will help athletes achieve an optimum body size and body composition to achieve greater success in their sport."

Are They Safe?

FDA does not test effectiveness, safety, or purity

- FDA does not analyze supplement products before they are sold to consumers. The manufacturer is responsible for ensuring that the ingredient list is accurate and that the ingredients are safe. They are also required to make sure that the content matches the amount declared on the label. FDA does not have adequate resources to analyze dietary products sent by consumers who want to know their content. Instead, consumers may contact the manufacturer or a commercial laboratory.

Are They Safe?

If the FDA does not test effectiveness, safety, or purity

- No guarantee of:
  - Accuracy of ingredient list
  - Accuracy of contents
  - Safety of ingredients
  - Research supporting efficacy

Are They Safe?

In Canada, stricter regulations are in place…

Before any supplement is produced/marketed, this product has to be cleared by the NHPD (Natural Health Products Directorate)

- Products & manufacturers licenses
- GMPs
- Adverse reaction reporting
- Clinical trials to support claims and safety
- Labeling conventions have to be used.

Are They Safe?

Danger of Contamination (2001)?

- 634 non-hormonal products
  - 289 of products came from companies that sold hormonal products
  - 345 came from companies that did not sell hormonal products.

- 94 samples were positive for banned substances and 66 were questionable (25%).

Strategies

1) Check with www.wada-ama.org

2) Check for supplement/drug/food interactions at www.merk.com/mmhe

3) Choose a larger company and look for certificates or 3rd party analysis. www.nsf.org has begun this but few supplements have been tested.

4) www.consumerlab.com tests for label claims

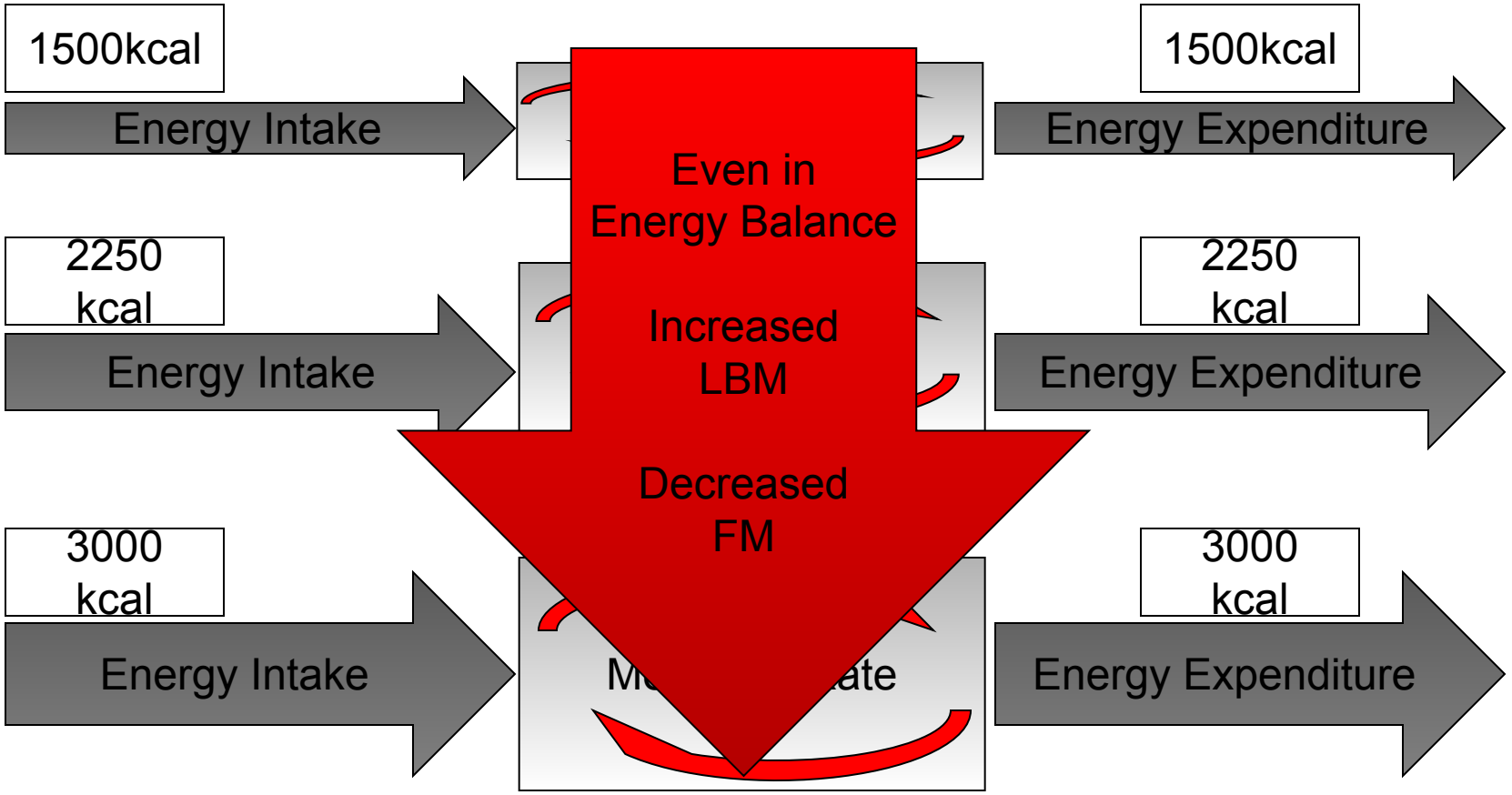
5) Choose products with few ingredients

…Time for a break…

A logical stepwise approach to fitness:

1) Get people moving more
2) Get them selecting better foods
3) Add exercise to promote adaptation
4) Begin to improve calorie balance
5) Begin to improve nutrient timing
6) Focus on maximizing G-Flux
    1) Optimized training loads, volume, intensities
    2) Optimized intake for activity and body type

When energy balance gets confusing…



Why is that? Ideas?

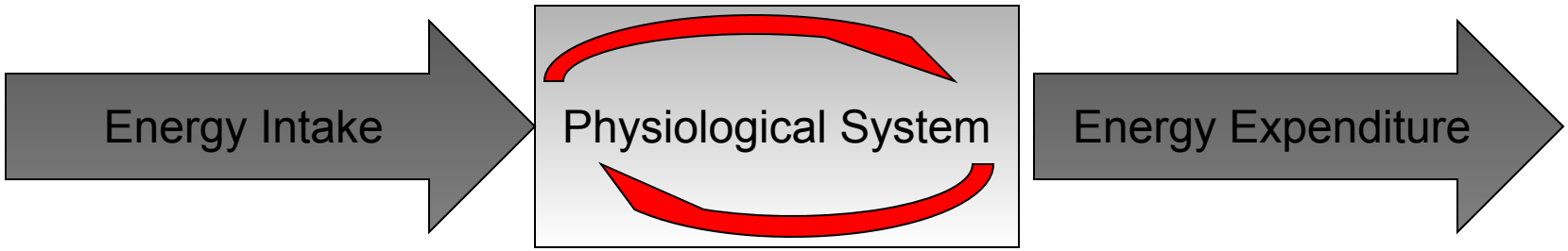
What can one expect during:

Energy balance? Positive Energy Status? Negative Energy Status?

G-Flux – What Is It?

What is G-Flux?

G-Flux means Energy Flow



Intake = Expenditure □ Weight ??
Intake > Expenditure □ Weight ??
Intake < Expenditure □ Weight ??

G-Flux Science

G-Flux Science

- Goran, M et al. Effects of increased energy intake and/or physical activity on energy expenditure in young healthy men. J. Appl. Physiology. 77(1) 366-371, 1994.

- Bell, C et al. High energy flux mediates the tonically augmented beta adrenergic support of resting metabolic rate in habitually exercising older adults. J Clin Endocrinol Metab 89: 3573-3578, 2004.

- Bullough, R et al. Interaction of acute changes in energy expenditure and energy intake on resting metabolic rate. Am J Clin Nutr. Mar; 61(3): 473-481, 1995.

G-Flux Science

Results:

High energy flux and positive energy balance groups both experienced an increase in RMR.

High energy flux subjects experienced an increase in LBM and a decrease in % body fat.

G-Flux Science

***Bell et al study**

Subjects in energy balance for 4 days (2254kcal/day)

|

Reduced energy flux at energy balance for 5 days (1851 kcal/day)

Results

1. RMR decrease with reduced energy flux (200kcal/day)
2. SNS activity decreased with reduced energy flux
3. Plasma leptin decreased in low energy flux state

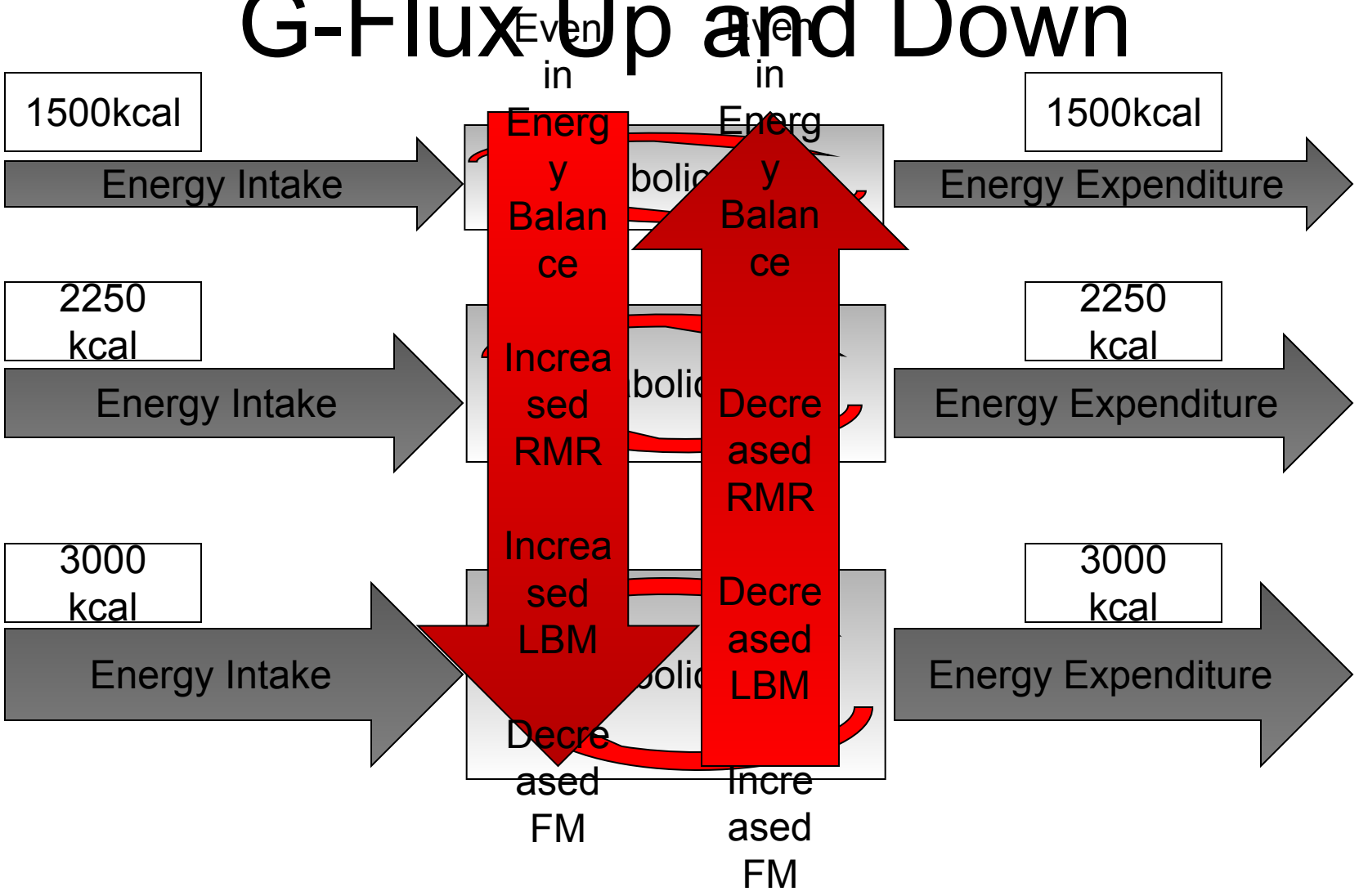
G-Flux Science

Results:

Subjects in high flux group had an 11% increase in metabolic rate vs low flux group.

Subjects in high flux group also had increased catecholamine concentrations.

G-Flux Up and Down



G-Flux Athletes

Kris Aiken – Toronto Argonauts

5’11” 195lbs 8%

Expenditure: 15 hours per week of training

Plus 5 hours of recovery work

Intake: 4500+ kcal per day

G-Flux Athletes

Tara Whitten – World Cup Jr. Medalist

5’6” 135lbs

Expenditure: 18 hours per week of training

PLUS 3 hours of recovery work

Intake: 3500+ kcal per day

G-Flux - Athletes to Exercisers

Not one of these athletes has to restrict energy intake! They train hard, eat the right things in the right amounts at the right times, and their body comp falls into line with their exercise. This is G-Flux firing on all cylinders.

Recreational exercisers need to take this lesson – by increasing exercise activity, G-Flux increases.

They can then EAT MORE and in doing so, health, body comp, and performance come into line.

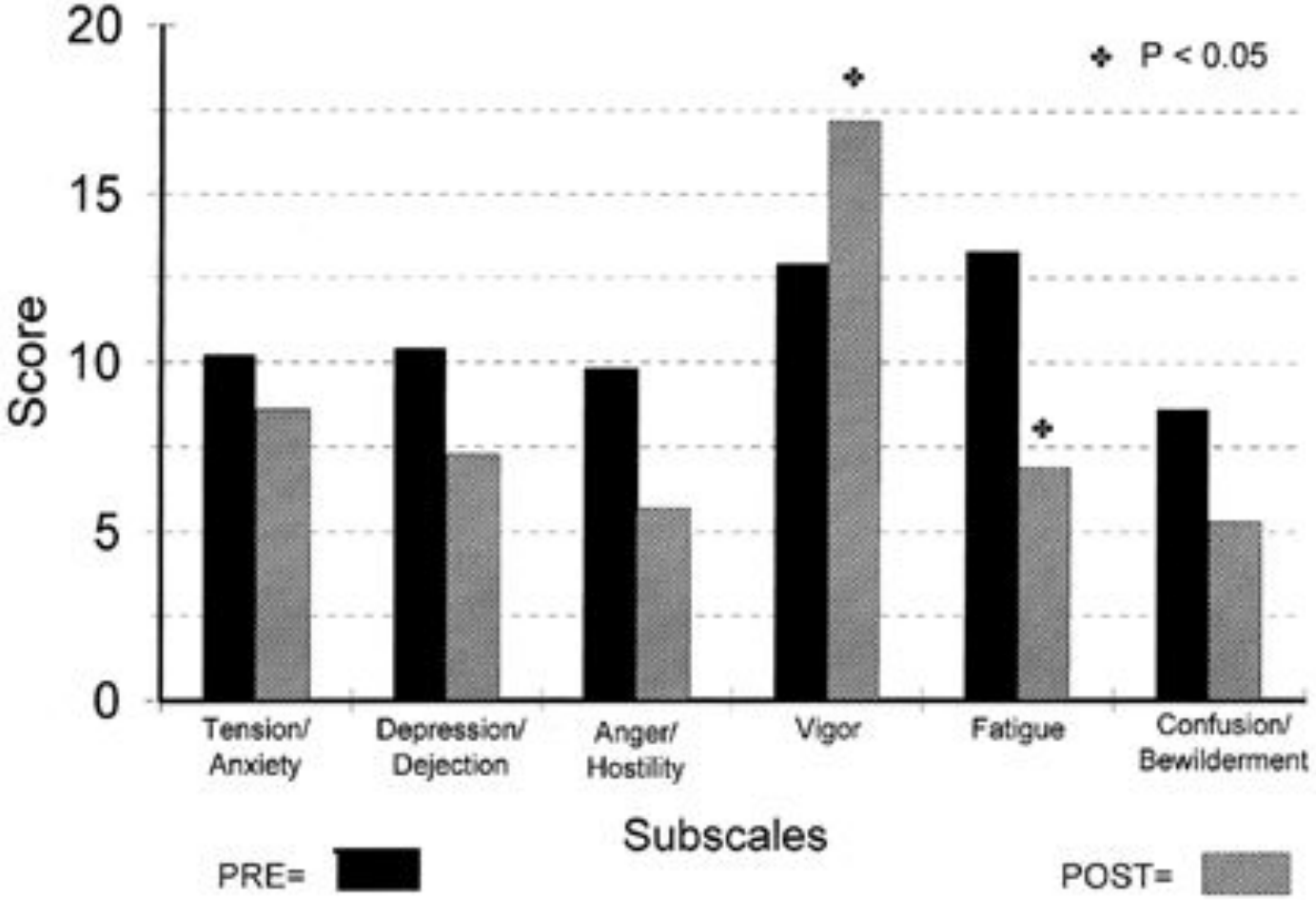
G-Flux and High Volume Training

Why aren't these individuals all overtrained?

With the right mixture of activities and the right nutritional intake, not only will overtraining be a non-issue, you will improve far faster than you thought possible.

Tools to assess recovery/training status:

POMS and Recovery



Recovery Assessment

Mood Quality	Rating (0-5)
Appetite	
Sleep Quality	
Tiredness	
Willingness to Train	

Resting Morning Heart Rate (beats/minute)	

Rusko Test:

HR average for 2 min lying

HR average 12-18s after standing

HR average from 90-120s after standing

G-Flux and High Volume Training

List the reasons why increased training volume, increased 24 hour energy expenditure, and increased food intake will lead to improvements in body comp and training.

G-Flux Highlights

What's the point?

70-85% of your daily calories burned come from RMR

2) High amounts of G-Flux can increase RMR (some think through the increase in SNS activity and catecholamine concentrations) and 24 hour non-exercise energy expenditure.

3) These changes can lead to decreased fat mass and increased lean body mass – even at energy balance.

Because you can eat more food. And because with that more food comes more vitamins, minerals, phytochemicals, etc.

Increased tissue turnover. And increased nutrient partitioning.
And this means better recovery and training adaptation.

G-Flux On Both Sides

G-Flux - both ends of the energy balance equation

High intake = eating alot (the right amount, type, timing)
High expenditure = Any combination of the following:

- High weekly exercise volume (properly balanced)
- Genetically high metabolic rate (it's a gift, folks – send M&D flowers)
- Genetically scalable metabolic rate (another gift)
- Increased muscle mass (remember 5:1 rule)
- Nutritional strategies (calorie costly foods, increased partitioning)
- Supplements (ephedrine, coleus, green tea extract, fish oil, etc)
- Drugs (thyroid hormones, clenbuterol, DNP, etc.)

Again, explaining how different people get the same result while seemingly doing different things…

G-Flux Take-Home

Perspective:

This is what some people hear…

Blah, blah, blah…

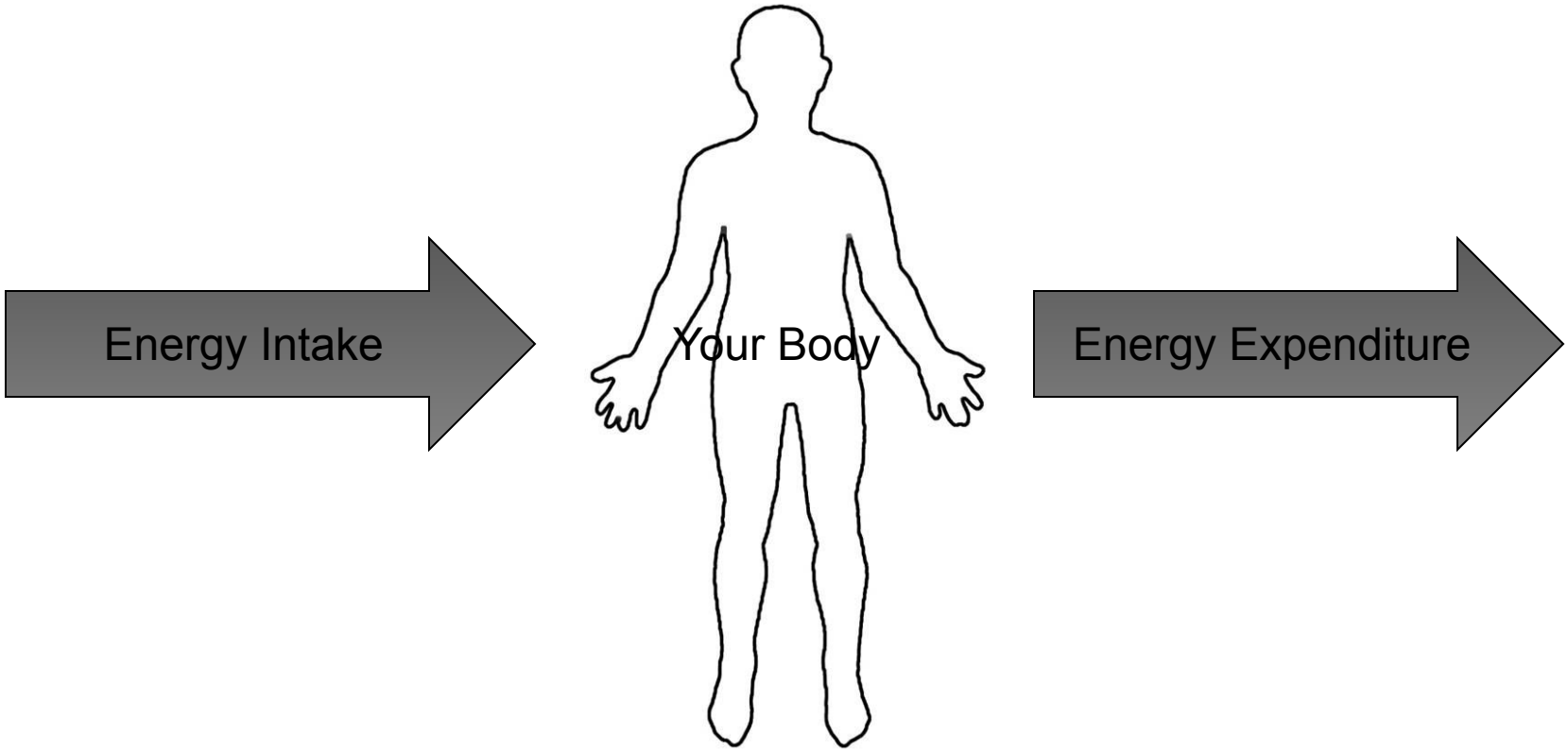
Eat more to lose weight…

What is the common theme with successful body comp programs?

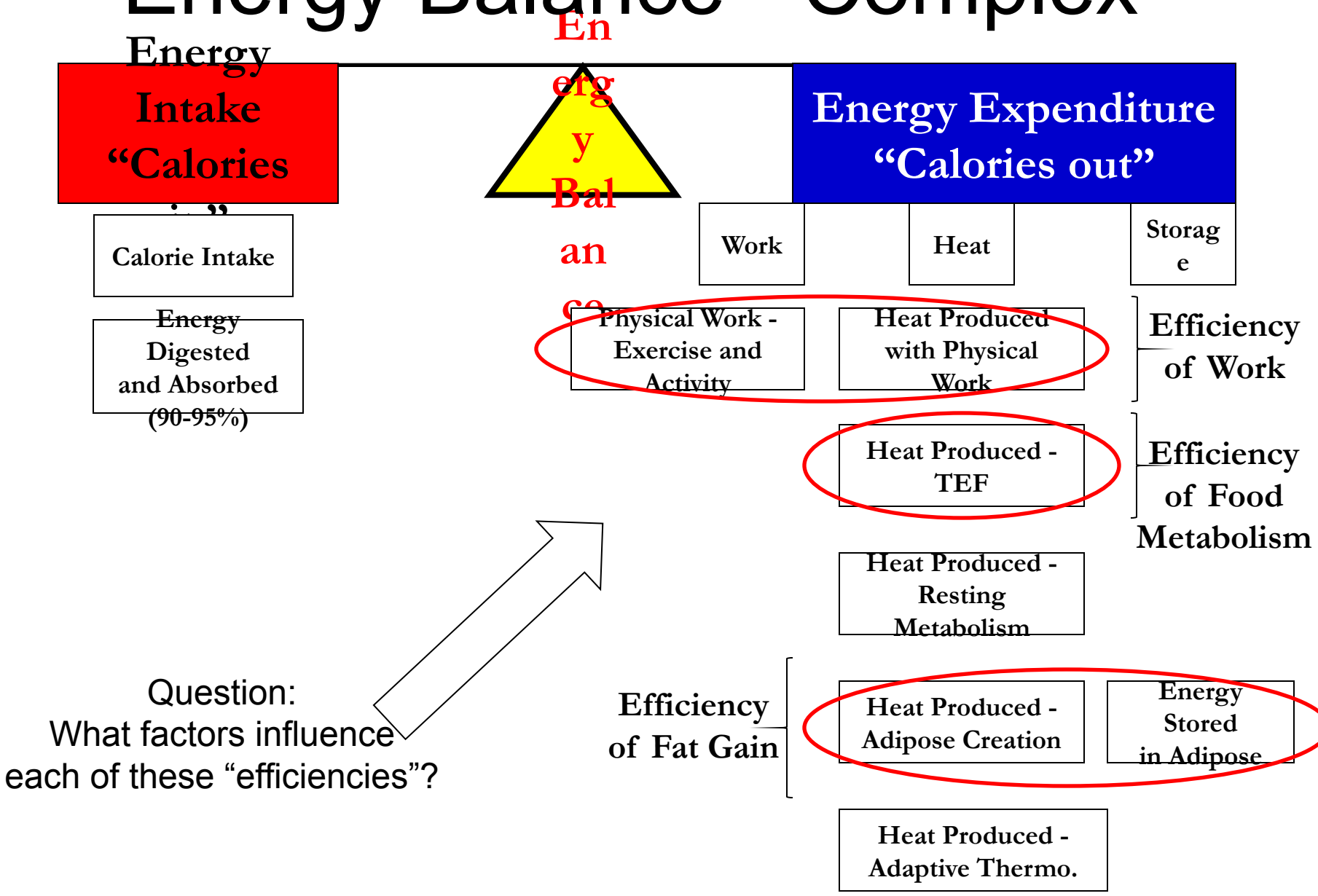
To take advantage of G-Flux there are 2 steps:

1) Exercise more
2) Eat more

Energy Balance Is Simple!



Energy Balance - Complex



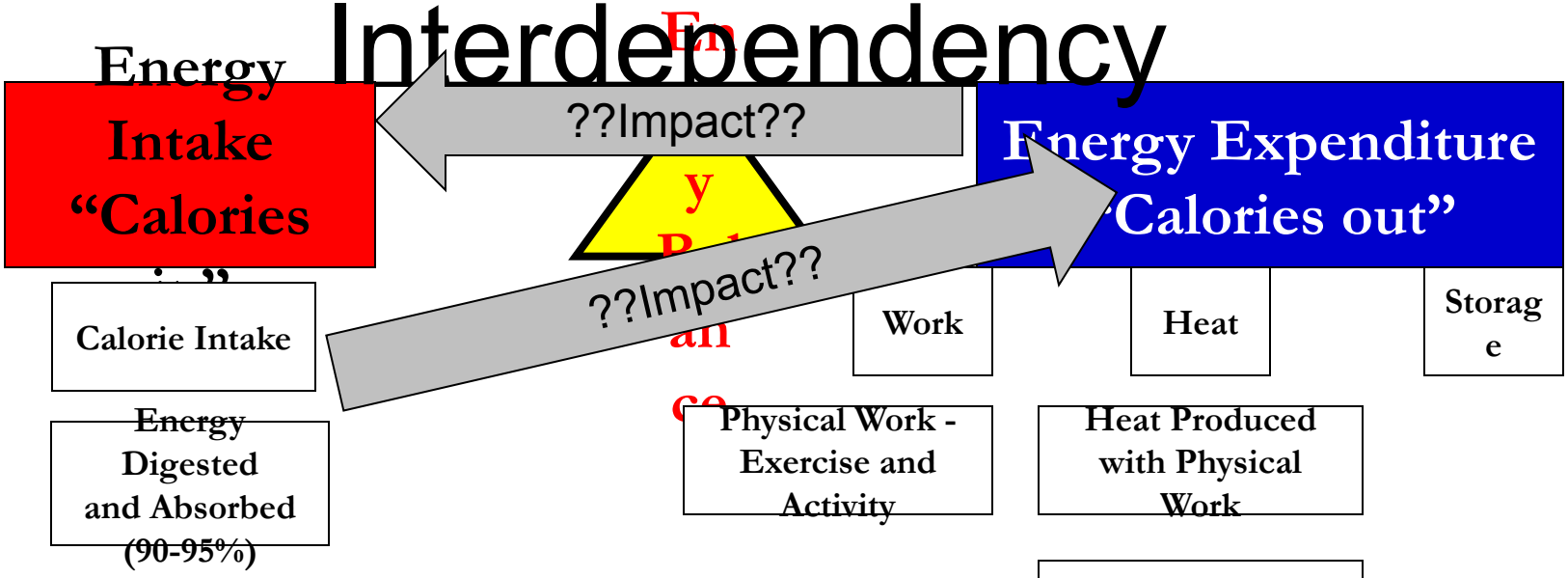
Energy Balance - Interdependency

If you eat less or eat more:
there will be metabolic compensation

Who cares?

In other words: energy expenditure chases energy intake & vice versa

Energy Balance – Interdependency



Which variables are impacted when intake changes?

Which variables are impacted when expenditure changes?

Energy Balance – Interdependency

Getting in shape is simple…
Just eat less and exercise more…

Yea…right…

Body Weight Regulation

- Perspective Questions:
  1) What's the net result of all this regulation?
  2) Why is all this happening?
  3) A good thing that the body regulates so well?
  4) When isn't it a good thing?

- Application Question:
  - When does this high level of regulation become problematic?
    - Body is at an undesirable weight/composition

Overcoming Regulation

How to change your body if regulating well?

(lots of talk between intake and expenditure)

- Option 1: The blunt object approach
  - You can outeat your metabolism for weight gain
  - You can undereat your metabolism for weight loss
  - Eventually you'll gain or lose…problems?
- Option 2: The G-Flux approach
  - Boost G-Flux to boost metabolism, LBM, and decrease FM
- Option 3: Uncoupling protocols
  - Strategies to prevent expenditure from downregulating too quickly or up regulating too quickly with dietary changes
  - Strategies change the ratio of BF to LBM gains or losses

Simple Body Composition

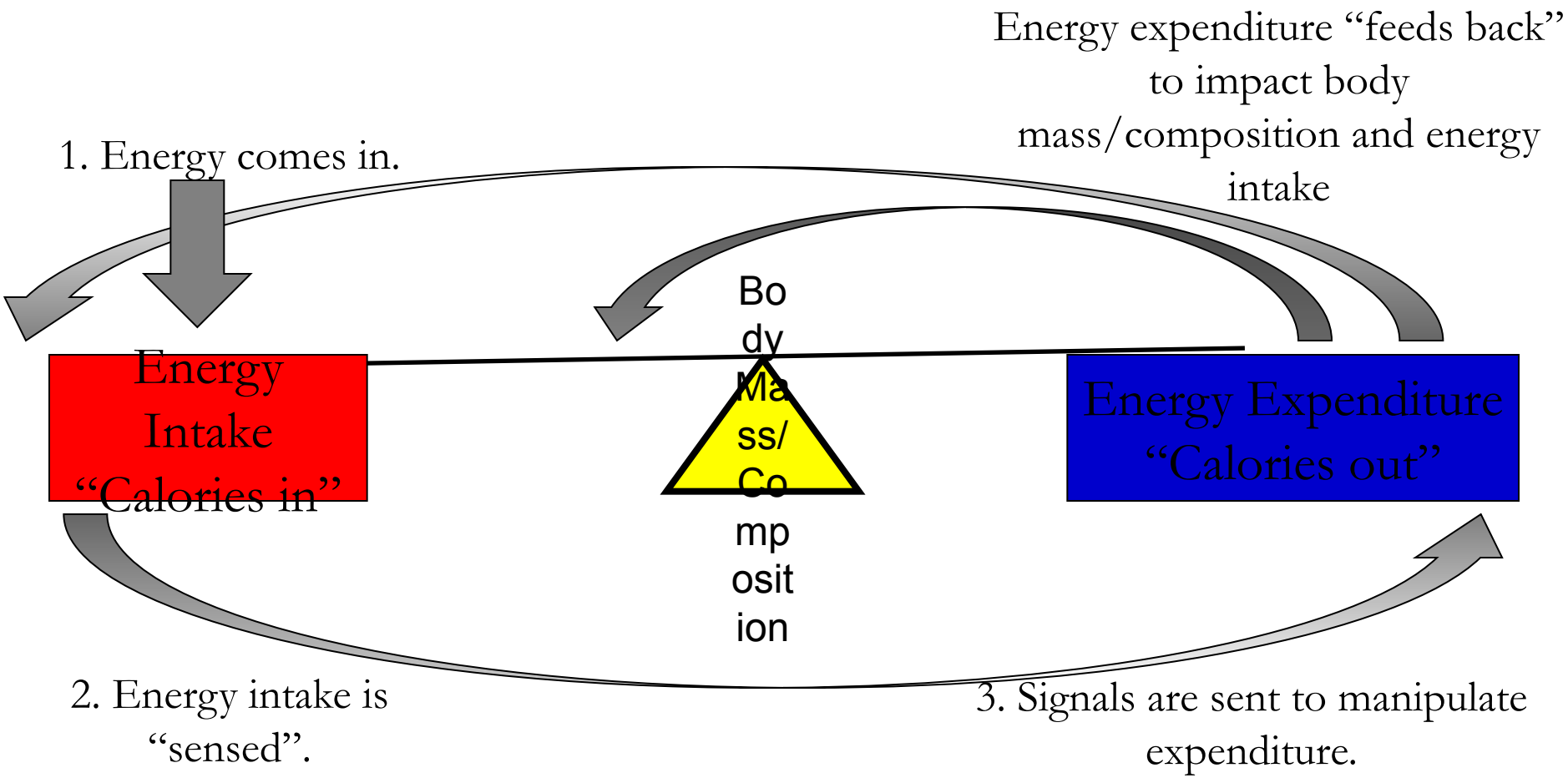
- Perspective Question:
  - So how do you get a great body without trying to control all of these variables, count every calorie absorbed, approximate metabolic shifts, attempt to figure out how well you regulate, etc?
  - Use the G-Flux principles with high exercise volumes and increased nutrient intake

When It Gets Complex

Why it doesn’t always work?

Application Question: Which types of individuals wouldn’t benefit from the “don’t count calories” model?

G-Flux Nutrition



In other words: energy expenditure chases energy intake & vice versa

G-Flux Nutrition

Calorie Intake

(Levine et al – Mayo Clinic)

When overfed, some subjects dramatically up regulate energy expenditure while others don't:

-16 sedentary lean individuals overfeed by 1000kcal (relative to pre-study calculated energy needs) for 8 weeks.

-Spendthrift subjects gained 0.2kg (~1/2 lb) of fat mass while others gained 4kg (~9 lb) of fat mass.

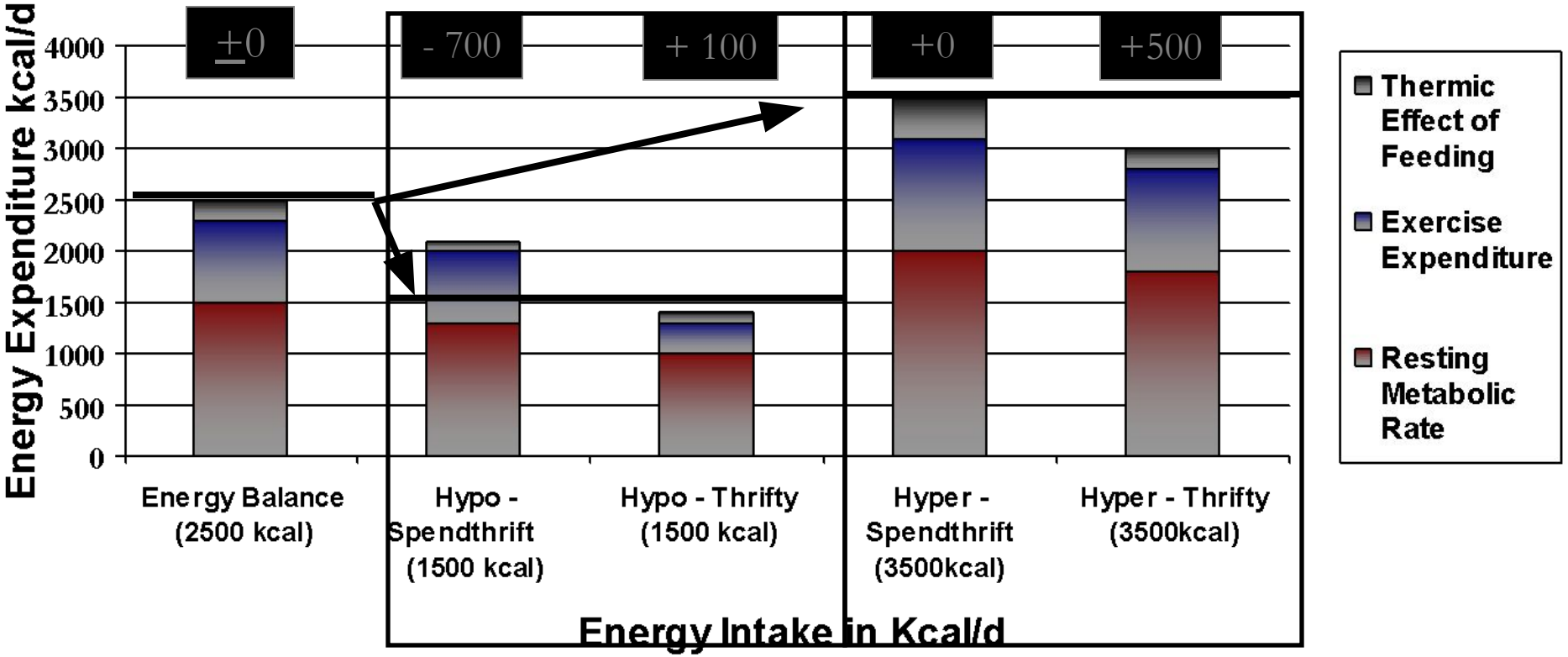
-All other variables (energy intake and exercise expenditure) were controlled.

G-Flux Nutrition

Energy Intake "Calories in"

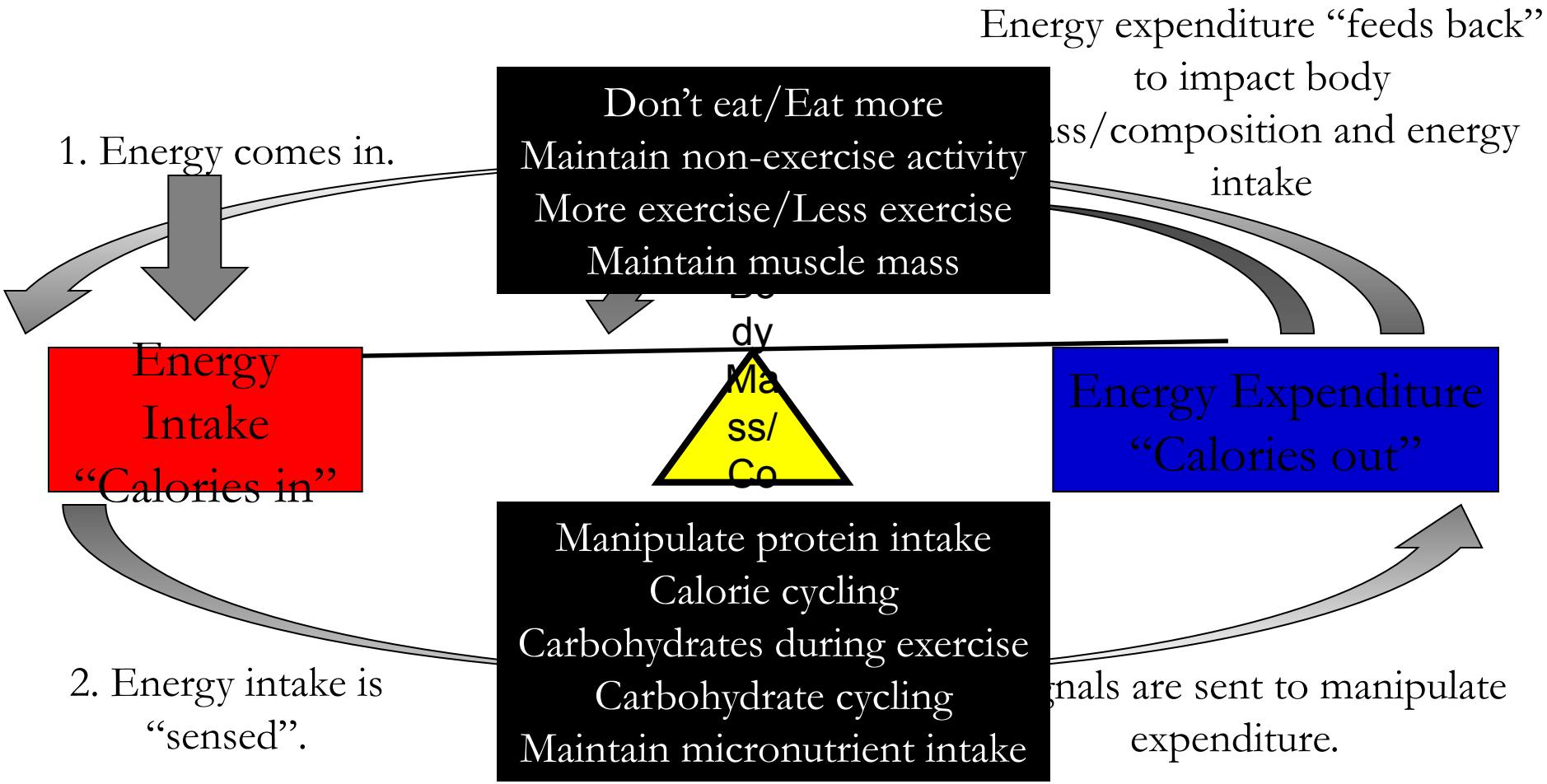
?

Energy Expenditure "Calories out"



*Dashed lines represent fixed energy intake

Breaking the Coupling



Breaking the Coupling

Strategies for uncoupling tight body weight regulation:

- Expenditure Side
  - Maintain expenditure with exercise
  - Muscle Mass Preservation
- Intake Side
  - Refeeds
  - Targeted Carbohydrate Intake
  - Hormonal Manipulations
  - Micronutrient Loading

Question and Answer