

Tribe

Sports Performance Nutrition



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Defining Sports Performance Nutrition

Athletes Have Special Needs!

- ✓ Require More Nutrients
- ✓ Increase in Protein
- ✓ Increase in Carbohydrates
- ✓ Increase in Vitamins and Minerals



Benefits of Proper Nutrition



- Decreased time of recovery
- Increased energy
- Decreased loss of muscle tissue in-season
- Increased stamina
- Decreased percent body fat
- Injury prevention
- Improved health
- **IMPROVED PERFORMANCE!!**

Sport-specific nutrition

- **Anaerobic Sports** (football, baseball, softball, volleyball, tennis, track & field).
 - ✓ Explosive strength is required w/long periods of rest.
 - ✓ ATP-CP immediate energy source.
 - ✓ High protein requirements for FT-muscle fiber.
 - ✓ Constant supply of carbohydrates to refuel bodies glycogen stores.
- **Total Caloric Ratio Need**
 - ✓ 15% Fat
 - ✓ 30% Protein
 - ✓ 55% Carbohydrate

Protein: Athletic Significance

- Proteins are the building block of muscle.
- Proteins spare muscle breakdown during exercise.
- Protein is essential for maintenance, growth & recovery.

Low-Fat Protein Food Sources

- 85-95% Lean ground beef, turkey, ham
- Beans & peas
- Skinless, grilled, baked, roasted chicken or turkey breast
- Seafood-steamed, boiled, baked or grilled
- Low-fat cottage cheese
- Cheese-2% or skim
- Milk-Skim or 2%
- White-tuna in water
- Trimmed steaks, lamb, pork chop
- Nuts or seeds
- Eggs or egg beaters
- Low-fat yogurt
- Turkey bacon or sausage



Protein: Energy & Digestion

- Ignore bodybuilding trends---more is NOT better!
- Only 20-30 grams of protein can be digested every 3-4 hours (excluding post-workouts).
- Excess protein is counter-productive, because it can be broken down into glucose & fatty acids.
- Avoid eating high protein meals 2-3 hours prior to an exercise or competition.

Protein: Specific Nutritional Needs

- Individual protein needs are based on your type of sport-activity & intensity.
- Athletes who participate in high-intensity sports need about 2-4 times the amount of the RDA of protein for muscle growth, maintenance & repair.
- Typically, protein requirements range 1.5-2.5 g/kg/of lean body mass.
- Protein needs are calculated & based on your **LEAN BODY MASS!!!**

Fat: Athletic Significance

- Essential Fatty Acids (EFA) are required for growth, recovery, & overall health.
- Fatty acids (FA) are an important source of energy.
- Aid in absorption of fat soluble vitamins.
- Protective padding for organs.

Fats: Specific Nutritional Needs

- Individual fat needs are based on your type of sport-activity & intensity.
- Anaerobic sport athletes primarily burn glucose and ATP-PC for fuel.
- Only 10-15% to total caloric intake is needed for recovery & overall health.

Fats & Athletic Performance

- Excess fat should be avoided.
- Minimize intake of saturated fatty acids and cholesterol.
- Eat a low fat meal before and after training competition. Fat takes long to digest!
- Include good sources of essential fatty acids.

Carbohydrates (CHO): Athletic Significance

- Primary source of energy.
- Primary glucose source in the muscle & liver.
- Body stores glucose in the form of glycogen.
- Glucose is primary fuel for brain & the CNS.
- CHO are involved in maintaining blood glucose levels which are vital to performance & appetite control.

Types of Carbohydrates

- **Examples of Simple Carbohydrates**
 - ✓ Sucrose (table sugar, cane sugar, beet sugar)
 - ✓ Maltose (malt sugar)
 - ✓ Lactose (milk sugar)
- **Examples of Complex Carbohydrates**
 - ✓ Raw fibrous vegetables like broccoli, spinach, carrots, green beans, cucumbers, tomatoes.
 - ✓ Grains like oats, breads, bran cereals, pasta, rice.
 - ✓ Starchy vegetables like potatoes, corn, peas, beans.

Simple vs. Complex CHO

Simple Carbohydrates

- ✓ Are absorbed by the body quickly.
- ✓ Can cause fluctuations/spikes in you blood sugar level (BSL) triggering an insulin reaction.

Quick increases in BSL cause:

- ✓ Increased appetite.
- ✓ Prevents fatty acid metabolism.
- ✓ Suppresses growth hormone release.
- ✓ Conversion of sugar to fatty acid.

Simple vs. Complex CHO

- **Complex Carbohydrates**
 - ✓ Are absorbed by the body slowly.
 - ✓ Digest & release glucose into bloodstream at slow & steady rate.
- **Slow release of CHO into the bloodstream:**
 - ✓ Regulates appetite.
 - ✓ Provides prolonged supply of CHO to the blood stream.
 - ✓ Provides a nutritional energy substrate which will further spare & replenish muscle & liver glycogen.

Specific CHO Nutritional Needs

- Athletes who participate in high intensity sports should minimize their sugar & fat intake because they are primarily burning glycogen for energy.
- Individual CHO needs are based on your type of sport-activity & intensity.
- Typically, CHO requirements range 6-11 g/kg/of lean body mass.
- CHO needs are calculated on based on your **LEAN BODY MASS!!!**

Water & Athletic Performance

- Glycogen is stored in the muscle and liver together with water.
- One gram of glycogen is stored with three grams of water.
- This means when glycogen is used, water weight is lost in the process.



Water & Athletic Performance

- Water replenishment is the most important factor during exercise.
- Outside the narrow range of 98-100°F, your body will always sacrifice muscle function for temperature regulation.
- Drink a minimum of 1 to 1.5 gallons/day.
 - ✓ Flushes out metabolic waste products
 - ✓ Maintains the bodies cooling system
 - ✓ Prevents muscle cramps, strains and pulls

Water & Athletic Performance

Dehydration equals:

- ✓ Reduced endurance levels
- ✓ Fatigue
- ✓ Poor stamina
- ✓ Reduced maximum recovery between workouts
- ✓ Muscle cramps and joint pain

Remember...thirst lags behind need!!!

Water & Athletic Performance

- Avoid High Carb Drinks that are over 10% simple sugars.
- If you drink 12oz. of plain water, 8 oz. of it will empty from your stomach within 15 minutes.
- If you drink 12 oz. of a $\geq 10\%$ sugar solution, less than 1% will empty in the same period. (Powerade)
- Simple glucose at 1-5% hardly inhibits stomach emptying at all, and does provide a boost to blood glucose. (Gatorade)
- Fructose at 2% enhances stomach emptying, causes less insulin burst and helps restore liver glycogen. (Exceed)

Vitamins & Minerals: Athletic Significance

- Vitamins & minerals are needed for normal metabolism, growth, maintenance & repair of tissues aside from overall health.
- Dietary surveys show that most athletes are deficient in one or several vitamins and/or minerals.
- Optimum vitamin intake is attained from foods & supplements.

Ergogenic Aids & Nutritional Supplementation

- **NCAA Supplement Review (99-72)**
 - ✓ Must meet NCAA Guidelines.
 - ✓ Must meet W&M Guidelines.
- **Nutritional Supplements:**
 - ✓ Ensure adequate amount of essential nutrients.
 - ✓ Allow athlete to consume desired amount of macronutrients without bulk of food.
 - ✓ Supply measurable amount of nutrients. Can improve physical performance, fat loss and muscle building.

Ergogenic Aids & Nutritional Supplementation

- Supplements are just that...**Supplemental!!**
- Whole foods should supply basic total caloric intake of an athlete's diet.
- Choose supplements that are high quality, professional grade.
- **There is no magic pill formula to success!!**

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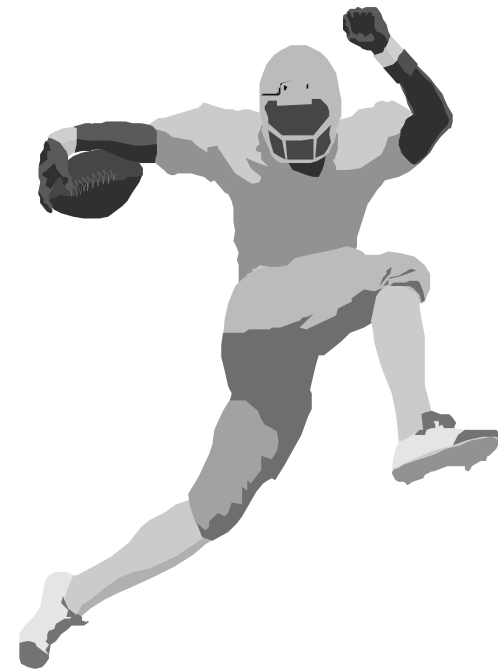
Ergogenic Aids & Nutritional Supplementation

- The average amount of money spent on nutritional supplements per month is between \$30.00 to \$60.00¹.
- Don't spend money on weight gainer or meal replacements, which are mostly 30-40% added carbohydrates.
- Carbohydrates are relatively cheap at about 1/10 the cost of an expensive protein.

¹Gastelu, DL 1995, Performance Nutrition. BodtCraft Magazine. Vol 1(1)

Ergogenic Aids & Nutritional Supplementation

- **Recommended Nutritional Supplements for the Economically Subsistent College Athlete:**
 - ✓ Whey Protein Powder
 - ✓ Multi-vitamin
 - ✓ Antioxidant Formula



Total Caloric Intake

- Need to increase total caloric intake on heavy activity days.
- If lean muscle is to be increased, caloric intake must meet caloric expenditure.
- You must take in enough calories to meet the physical demands of your day-to-day activities. If not, the body is forced to sacrifice lean muscle tissue for energy.

Total Caloric Intake

- **Caloric deficit will result in:**
 - ✓ Loss of lean muscle tissue
 - ✓ Increase of fat mass
 - ✓ Lower the body's basal metabolic rate (BMR)
 - ✓ Diminish overall performance
 - ✓ Lead to over-training and injury



Caloric Expenditure Guide

Intensity	Activity Type	Men cal/kg/day	Women cal/kg/day
Very Light	Seated , standing, typing, cooking, driving	25	20
Light	Walking, golfing, table tennis	30	28
Moderate	Fast walking, cycling, skiing, circuit training, dancing	36	32
Heavy	Sprinting, basketball, football, intense weightlifting	42	35
Very High	World Class Training	50	42

Athletic Calorie Requirements

Body Weight (KG) x Caloric Expenditure

Profile Example:

295 lb. lineman with 20% body fat

- ✓ $295 \text{ lb.} \times 0.20 = 59 \text{ lb. fat mass (FM)}$
- ✓ $295 \text{ lb.} - 59 \text{ lb.} = 236 \text{ lb. lean muscle mass (LMT)}$
- ✓ $236 \text{ LMS} / 2.2 = 107 \text{ kg. LMT}$

Caloric Expenditure Guide:

42kcal/kg/day (Intensity:High)

- ✓ $42 \text{ kcal/kg/day} \times 107 \text{ kg. LMT} = 4505 \text{ kcal/day}$

Meal Frequency

- **Divide Kcal into 6 Meals** (every 3-4 hours)
- ✓ Add 30% of last meals kcal to first.
- **Example:**
 - 295 lb. Lineman
 - $4500 \text{ kcal} / 6 \text{ meals} = 750 \text{ kcal/meal}$
 - $750 \text{ kcal} \times 0.30 = 225 \text{ kcal}$ ($750 + 225 = 975 \text{ kcal}$)

First meal has 975 kcal (breakfast and post workout/practice should be largest meal of the day)

Meal 2-5 have 750 kcal

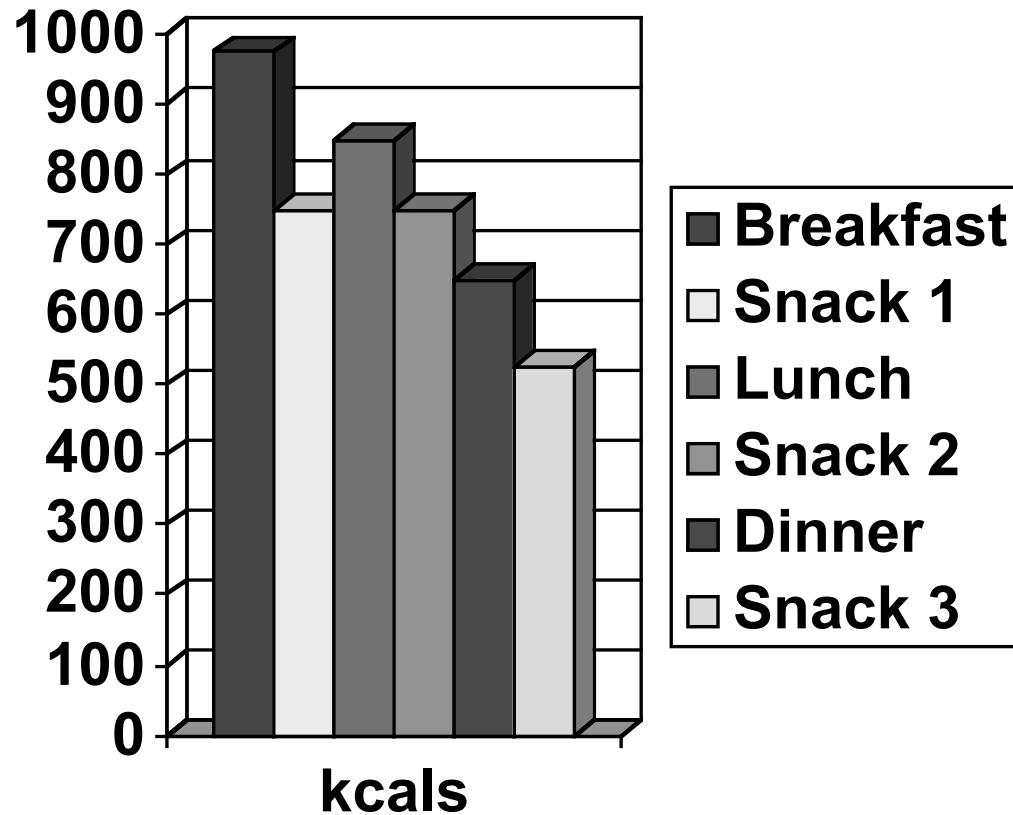
Last meal has 525 kcal ($750 - 225 = 525 \text{ kcal}$)

Meal Frequency

- **Meal frequency is the most important factor in any weight management program!**
 - ✓ Keeps metabolic rate elevated.
 - ✓ Maintains blood sugar levels.
 - ✓ Maintains energy throughout the day.
 - ✓ Provides small “packets” of macro/micro nutrients throughout the day.

Meal Frequency

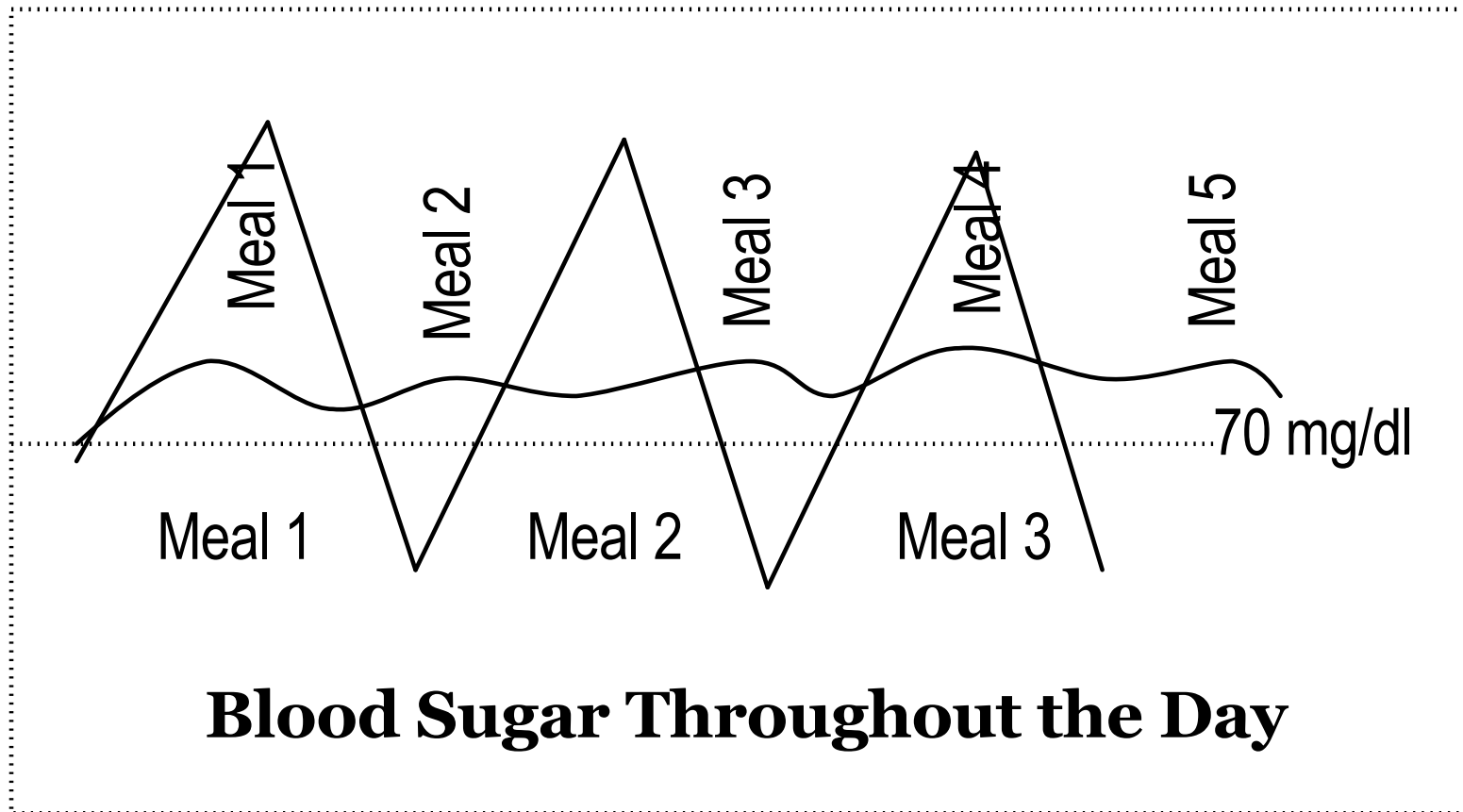
Ideal 4500 Kcal Diet



- 10 to 20% increase in metabolic rate.
- This benefit is enhanced if each smaller meal contains protein.

Chart taken from Aaron Shelley, CSCC Presentation 2001

Meal Frequency



Meal Frequency

- Smaller more frequent meals provide macro & micronutrients more often.
 - ✓ Enhanced utilization of protein, carbohydrate, fat, vitamins, minerals and antioxidants.
- Greater recovery and tissue repair between workouts.
- Decreased fat storage from excess calories.
- Optimal position to build muscle mass.

Meal Frequency: Optimum Digestion

- **Window of Opportunity**
 - ✓ One hour after workout.
 - ✓ 50 grams of Protein, 100 grams of CHO as post-workout rule.
 - ✓ Key is to replenish muscle glycogen!!



Meal Frequency: Optimum Digestion

- Limit carbohydrate (complex and simple) intake in the later evening when activity level is low.
- Evening meals should consist of a high source of lean proteins and fibrous vegetables & a low source of starchy/grain CHO to prevent excess calories and fat storage (*excluding evening practices*).
- Eating the right combination of foods during your pre & post training workouts will be effectively replenished your bodies energy systems.

Effective Fat Loss

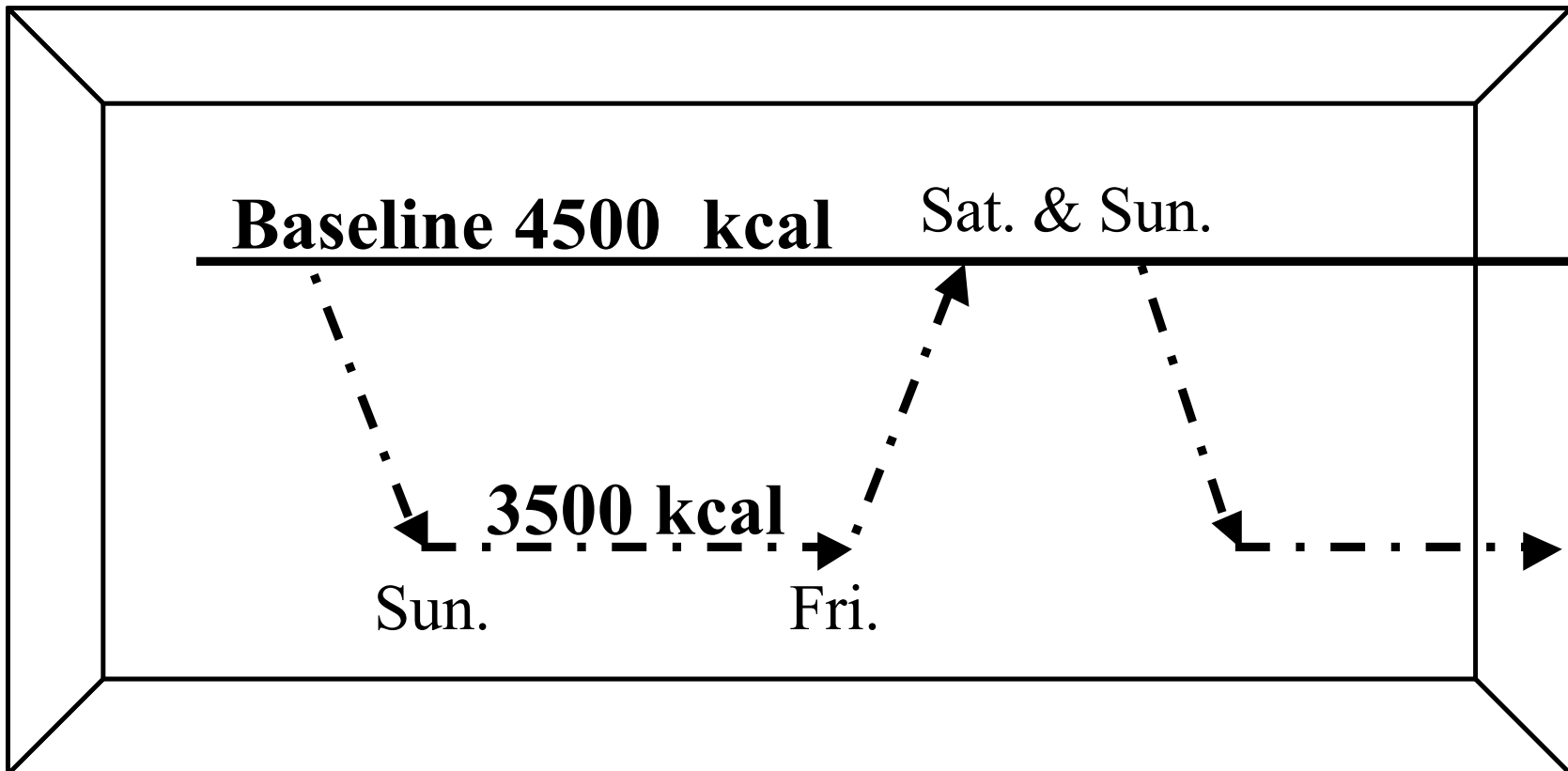
- If you starve yourself, you will lose:
 - ✓ **50% Muscle, 20% Water, 30% Fat**
- Losing more than 1-2 pounds per week will result in the loss of lean muscle tissue
- The true measure of weight loss is in body composition changes
- Fat loss should occur in the off-season
- Target weight should be met 6 weeks before season begins to allow body to adjust to its new weight

Zig-Zag Method to Decreased Fat Mass

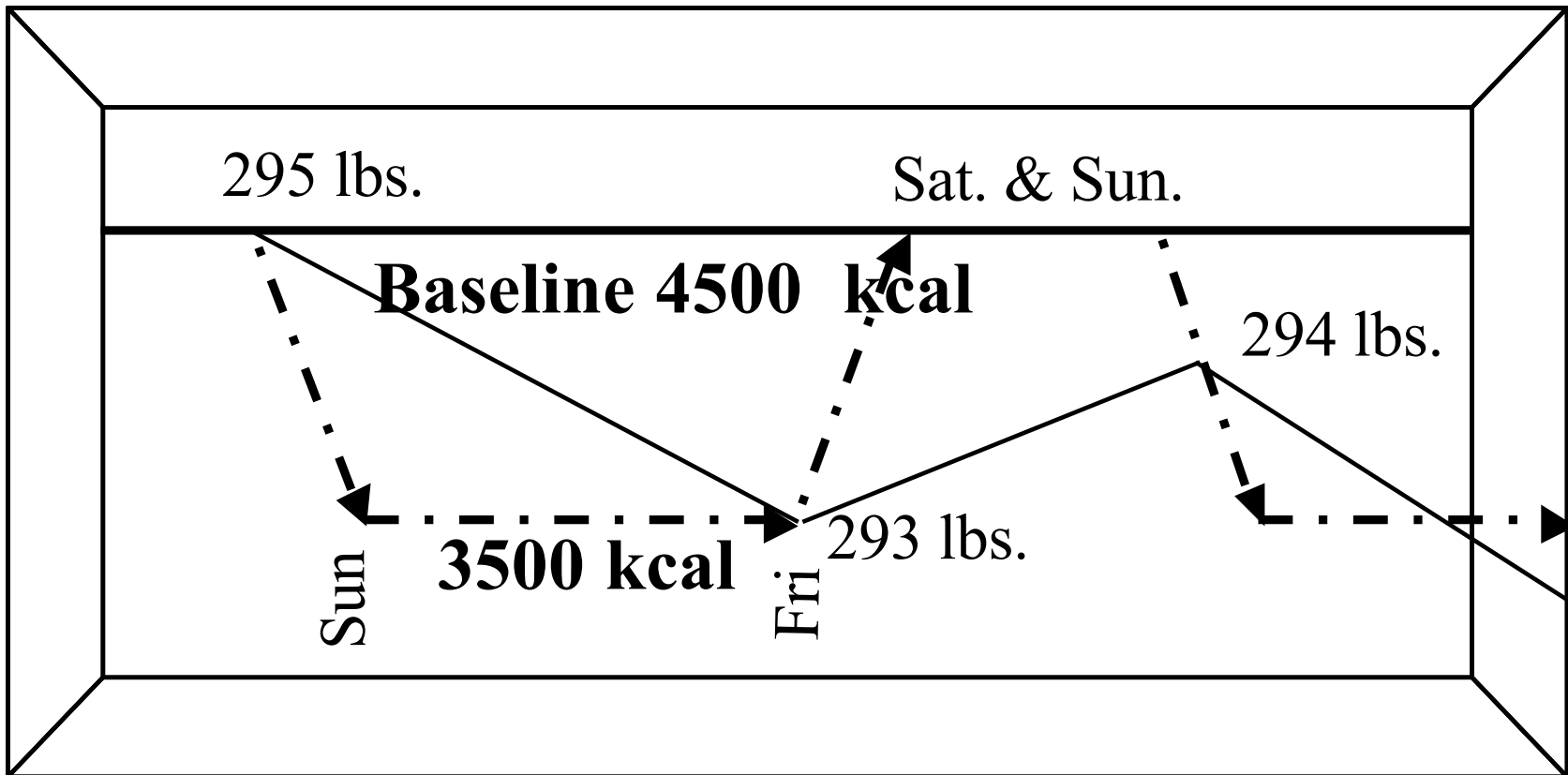
- The ZigZag Method reduces body fat while keeping the bodies basal metabolic rate (BMR) at high levels.
- Typically, when the body loses weight there is a corresponding drop in BMR due to the loss of muscle tissue and the bodies adjustment to conserve energy.
- In order to keep the BMR from falling, one or two days per week should be devoted to eating the normal amount of calories, followed by 5-6 days of reduced caloric intake.
- The lowered caloric intake (Sunday lunch through Friday Lunch) in conjunction with strength & aerobic training will reduce body fat while maintaining lean muscle mass.

Zig-Zag Method to Decreased Fat Mass

4500 Kcal Changes Using ZigZag



Zig-Zag Method to Decreased Fat Mass



10 Steps to Fat Loss...

1. Never skip meals.
2. Exercise daily (aerobic 3x/week).
3. Keep protein levels up, thus maximizing the thermogenic effect.
4. Eat high quality proteins that are low in fat. Vigorous weight training will maintain or increase lean muscle tissue.
5. **DO NOT** drastically reduce your daily caloric intake. Reduce your daily intake of fat to 10% or less.

10 Steps to Fat Loss

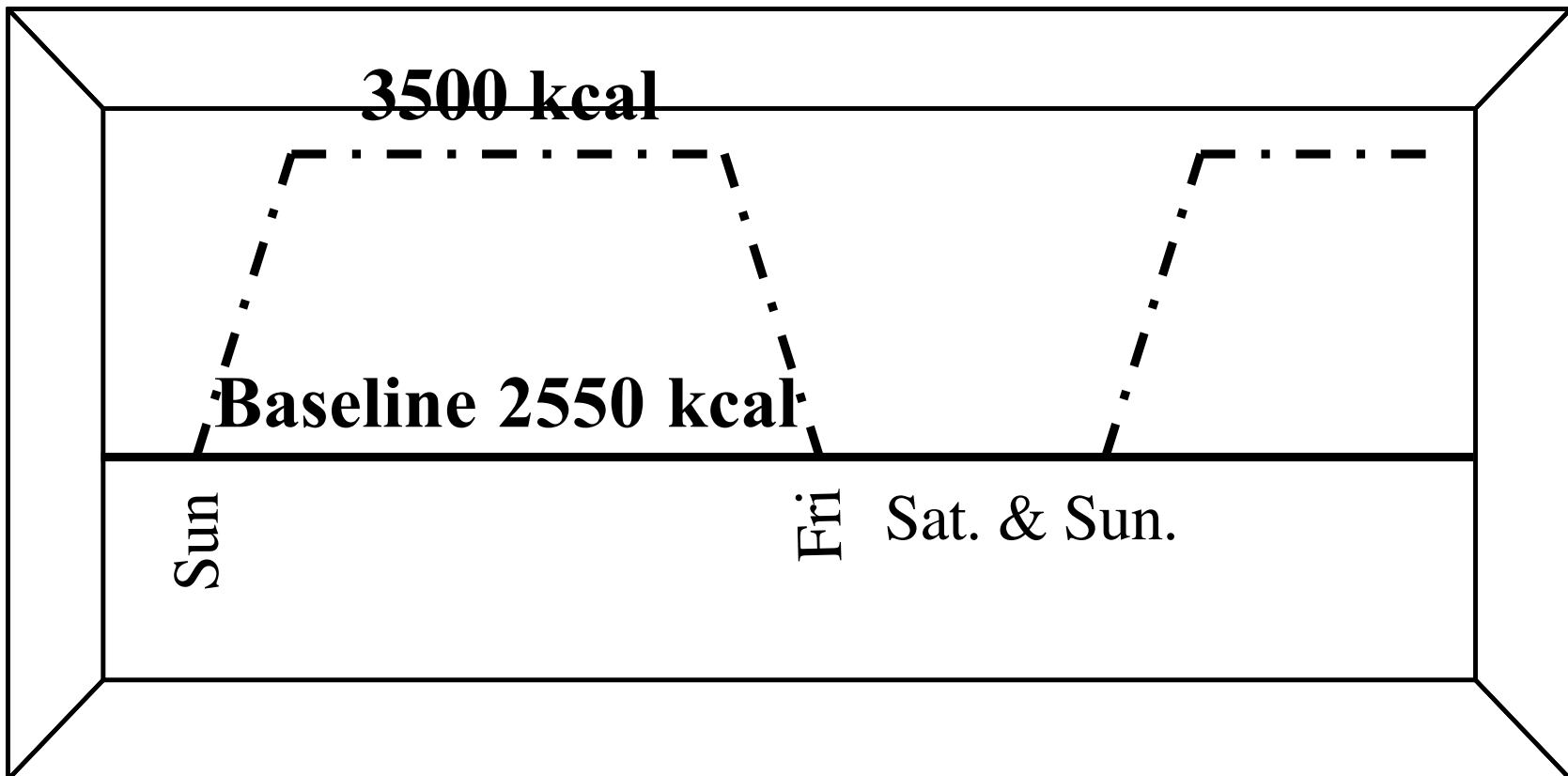
6. Increase dietary fiber to help satisfy hunger.
7. Eat plenty of vegetables throughout the day.
8. Avoid processed foods and “snack foods”.
9. Do not fry foods in oil or fat. Instead, bake, broil or microwave foods.
10. Avoid / Reduce the use of sauces and condiments that have a high fat or sugar content.

Zig-Zag Method to Increased Muscle Mass

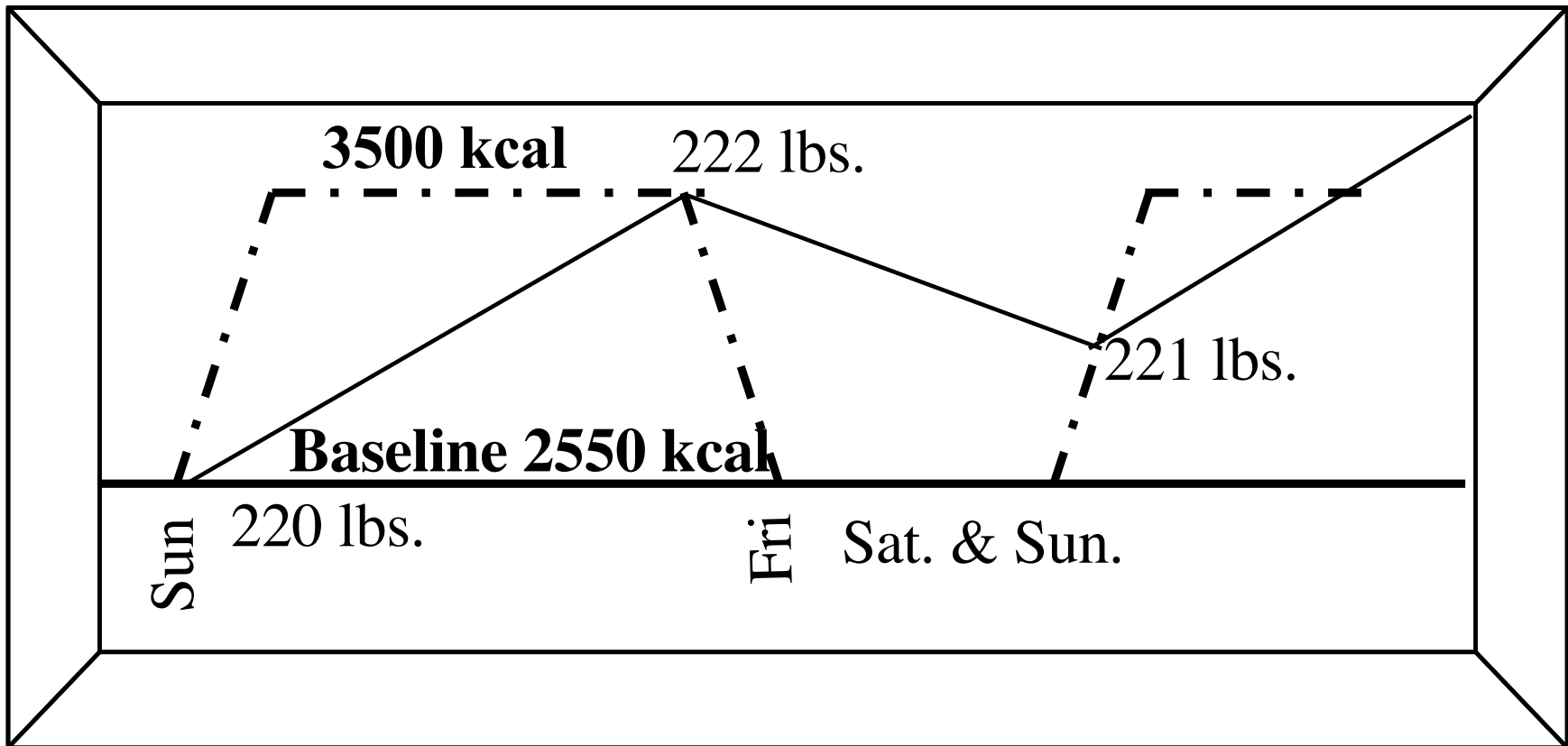
- Athletes incorporate the ZigZag approach by increasing caloric intake for 4-5 days, typically Sunday lunch through Friday lunch, which will allow you to add muscle mass as well as fat mass.
- Then for the following 1-2 days, typically Friday dinner through Sunday breakfast decrease your caloric intake (500-1000 calories), which will shed fat weight off and leave the muscle mass.
- This ZigZag Method to muscle mass ensures the weight gained is muscle while giving the athlete a break from eating a high calorie diet.

Zig-Zag Method to Increased Muscle Mass

3500 Kcal Changes Using ZigZag



Zig-Zag Method to Increased Muscle Mass



6 Steps to Increased LMIM

- You must eat 5 to 6 meals daily.
- Keep fat intake low – no more than 10 – 18% of total daily caloric intake.
- Make sure you are getting the proper amount of protein each day.
- Adjust protein and carb consumption according to increases in LBM
- Supplement your diet with **quality** supplements.
- Maintain aerobic exercise because it helps to burn fat and increases blood .

Example

- **Joe Wardaddy**
- **Football (in-season)**
- **275 lbs./125 kg**
- **25% bodyfat**
 - **$125 \times 25\% = 31.25 \text{ kg}$ (fat mass)**
 - **$125 - 31.25 = 94.75 \text{ kg}$ (lean body mass)**
- **42 kcal/kg/day (activity level) x 94.75 kg(LBM) = 3960 kcal/day**
- **15% fat - 30% protein - 55% carbs (ratio for football)**
 - **594 fat kcal - 1188 protein kcal - 2187 carb kcal**

Example meal breakdown

Joe Wardaddy

- **Breakfast** 858 kcal
- **Snack 1** **660 kcal**
- **Lunch** **760 kcal**
- **Snack 2** **660 kcal** *(post workout: 50g protein/100g carbs)
- **Dinner** **560 kcal**
- **Snack 3** **462 kcal**
- *Total kcal* *3960 kcal*

Learning Experience

Group Activity

Group 1

- ✓ Design a post workout meal.

Group 2

- ✓ Design a pre-workout meal.

Group 3

- ✓ Design breakfast meal.

Group 4

- ✓ Design a dinner meal.



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Sports Performance Nutrition

Questions???

**Schedule an appointment for a personalized
dietary assessment!**

Acknowledgement

Original presentation designed by:
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