

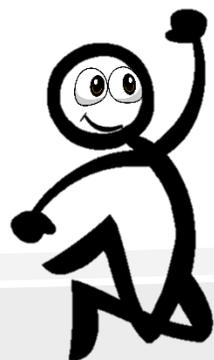
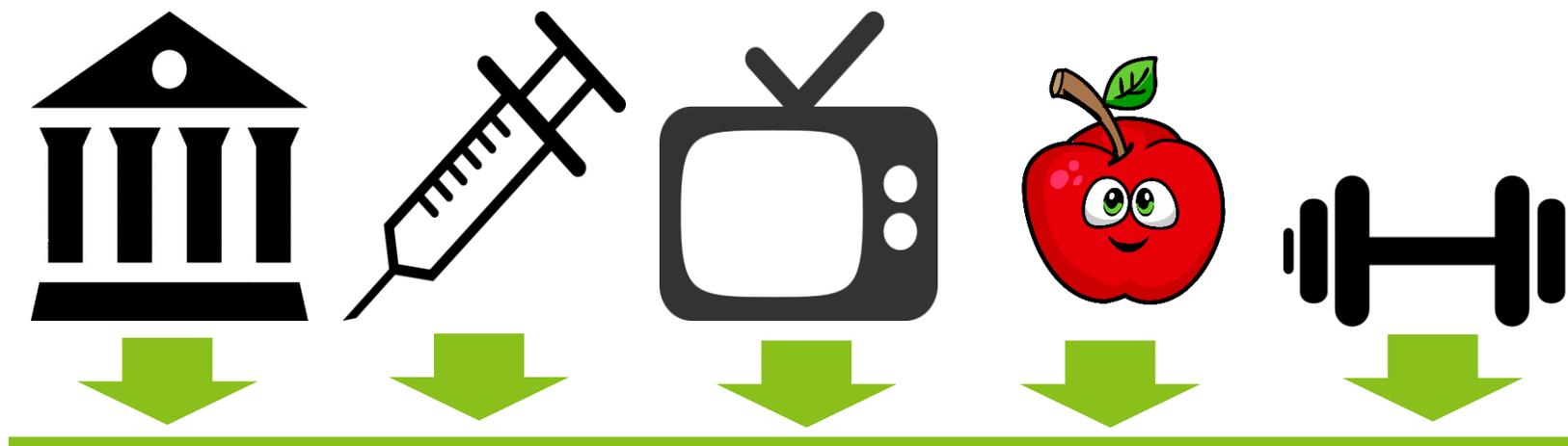
Sports Nutrition

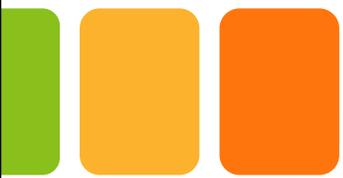
Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E

 **Application in Motion.com**



Who are the Players





Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E



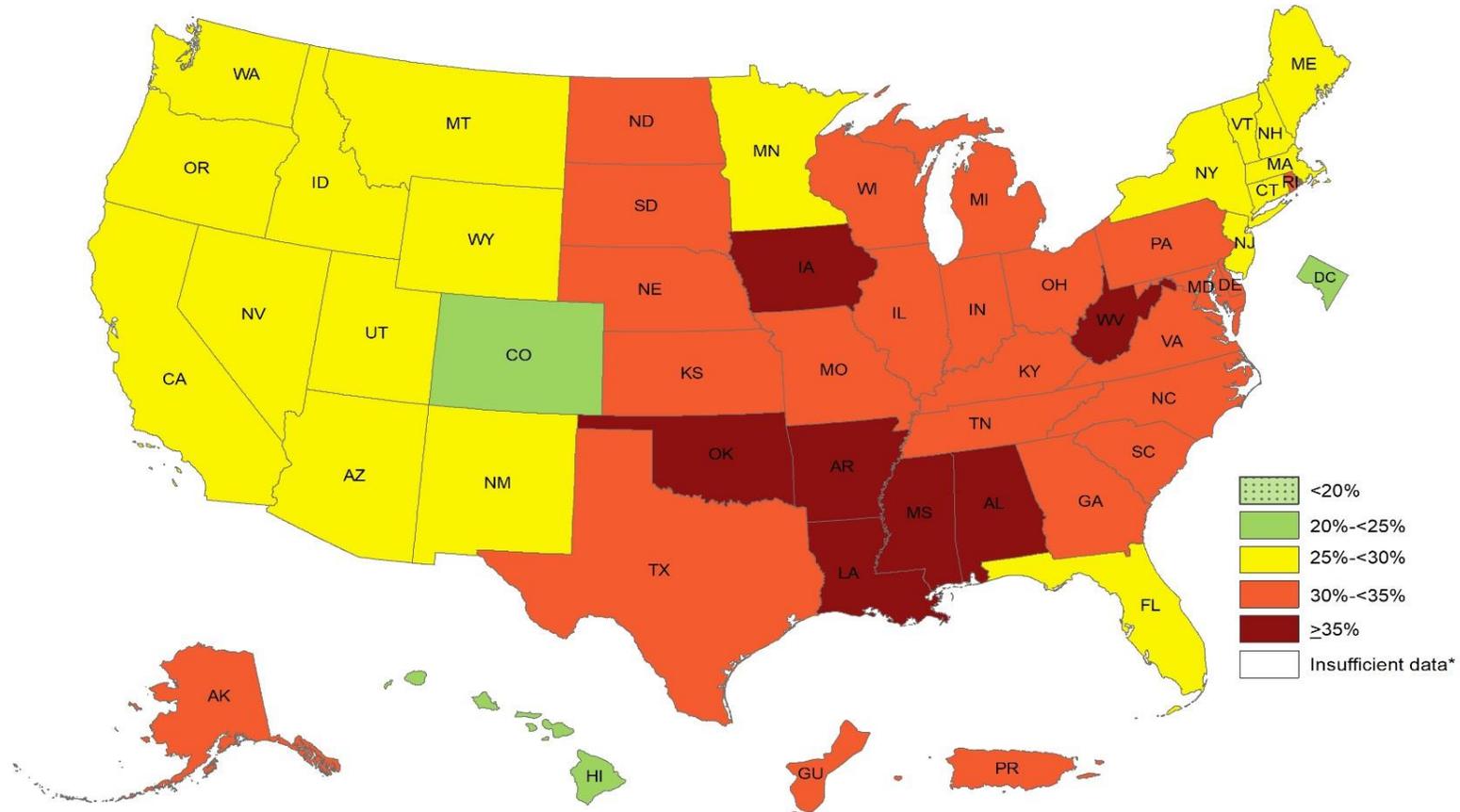
Carbohydrates
Proteins
Fats



Obesity Trends* Among U.S. Adults

BRFSS, 2017

† Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

e Rickett 2020 ©





Sites to Look at

- www.choosemyplate.com
- www.usda.gov
- www.fda.gov

FDA

RDA

ESADI





Calories

- Measurement of energy.
- High calorie diets
- Low calorie diets





Certificating – Consultant Limits

- Education
 - Macro / Micro Nutrients
 - Vitamins / Minerals / Water
- ***No specific meal planning***



Reading Food Labels

A Healthy Habit: Read Food Labels

Scan the Nutrition Facts panel on packages to evaluate what's inside and compare the nutrient value of foods.

Start Here

Serving Size is the amount of food the nutrient information is based on. Calories is the amount of "energy" in that serving. Adjust the amount of calories and nutrients if your serving size is different.

Limit all types of fat, especially saturated and trans fat which are linked to health problems.

Most of the fat you eat should be unsaturated.

In general, the greater the difference between "total carbohydrate" and "sugars," the more nutritious the carbohydrate.

Most people should get 50-75 grams of protein daily.

Percent Daily Values are based on eating 2,000 calories a day.

Active teens may need more. Most children, women and older adults need less. 2,500 calorie diets for more active teens and adults.

Nutrition Facts			
Serving Size: 6 crackers (28g)		Servings Per Container: About 13	
Amount Per Serving		Calories from Fat 40	
		% Daily Value*	
Total Fat 4.5g			7%
Saturated Fat 0.5g			4%
Trans Fat 0g			
Polyunsaturated Fat 2.5g			
Monounsaturated Fat 1.5g			
Cholesterol 0mg			0%
Sodium 180mg			7%
Total Carbohydrate 19g			6%
Dietary Fiber 3g			13%
Sugars 0g			
Protein 3g			
Vitamin A 0%	Vitamin C 0%		
Calcium 0%	Iron 8%		

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Sat. Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

If food gets a lot of its calories from fat, eat sparingly. Total fat intake should be no more than 30% of total calories.

Percentages show whether the nutrients in one serving contribute a lot or a little to your total daily intake — 5% or less is "a little" and 20% or more is "a lot."

Limit These

Too much fat, cholesterol and sodium contribute to health problems (refer to "less than" recommendations in footnotes).

Get More of These

Carbohydrates should be 55-65% of total daily calories. Get more natural than added sugars (check ingredients).

"Get enough" of nutrients beneficial to good health, such as vitamins A and C, minerals calcium and iron, and fiber.

Footnotes

Not specific to the food, and not required on label.

The amount of each nutrient recommended daily.

The amount of calories in fat, carbohydrate and protein (fat has more than double).



Take a look at:

1. Serving size
2. Calories/Calories From Fat
3. Nutrients You need
4. The Footnote
5. Daily Values (% DV)

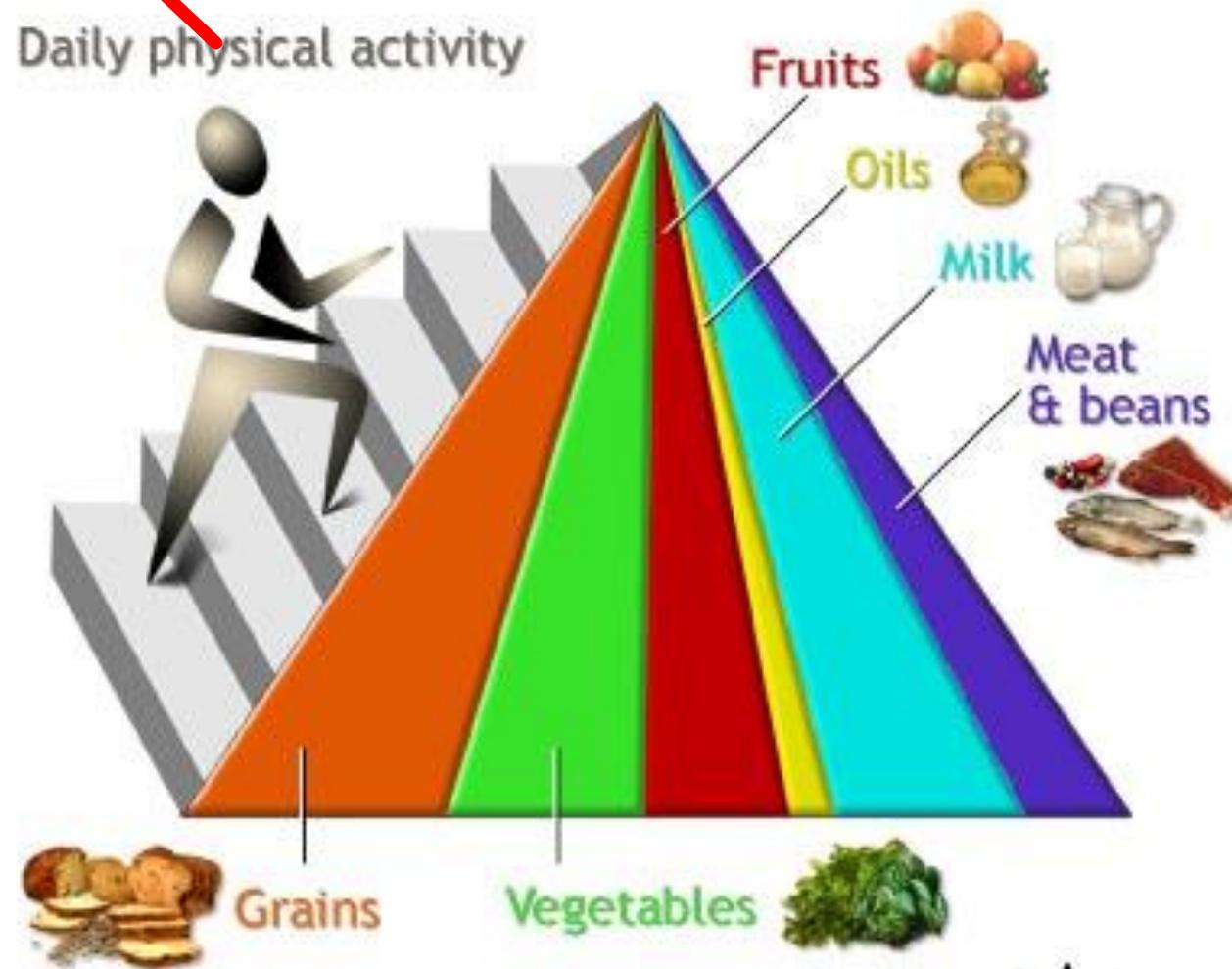
Ingredients to avoid:

1. Sugar in first five ingredients
2. High Fructose Corn Sugar
3. Enriched flour
4. Saturated / Saturated fat
5. Aspartame





~~www.mypyramid.com~~





New Food Pyramid / Plate



Carbohydrates (CHO)

- Energy
- Regulating Hormone
- Types
 - Simple
 - Monosaccharides ($C_6H_{12}O_6$) - Glucose
 - Disaccharides ($C_{12}H_{22}O_{11}$) - Maltose
 - Complex
- Where Does Digestion Start?
- Time to digest
- 4 Kcal / gram
- Sources:
 - Vegetables, Fruits, Grains, Legumes, etc.



Fructose
Sucrose

Galactose
Lactose



Proteins - (NH₂)

- Body Building Blocks
- Regulating Hormone
- Types
 - Non-essential
 - Essential (T.V. T.I.L.L. P.M. +H.)
- Where does digestion take place?
- Time to digest
- 4 Kcal / gram
- Sources:
 - Fish, Eggs, Poultry, Dairy, Meat, Tofu, Vegetarian Combinations, etc



Fats (H)

- Types
 - Triglycerides (Glycerol with 3 fatty acids)
 - Saturated
 - Monounsaturated (Omega-6) / Polyunsaturated (Omega-3)
 - Trans
- Functions
- Regulating Hormone
- Measurements
- Where does digestion/absorption take place?
- Time to digest
- 9 Kcal / gram
- Sources?

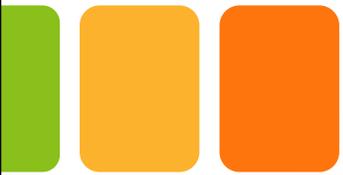




Summary

- Carbohydrates, Proteins and Fats work together
- Percentages are as Individual as the person
- Fad Diets do not Work!
- Remember: Just because you look good doesn't mean your healthy!





Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E



Vitamins
Minerals
Fiber
Water





Vitamins:

Organic compounds necessary for metabolic functions such as digestion, absorption, and energy release.

- Antioxidants
- Fat Soluble (A,D,E,K)
- Major Vitamins



Major Vitamins

- Antioxidants
- Fat Soluble (A,D,E,K)
- Major Vitamins



- **Vitamin A***
- Vitamin B₁ (Thiamin)
- Vitamin B₂ (Riboflavin)
- Vitamin B₃ (Niacin)
- Vitamin B₆ (Pyroxidine)
- Vitamin B₁₂ (Cobalamin)
- **Vitamin C**
- **Vitamin D**
- **Vitamin E**
- Vitamin K
- *Folic Acid*



Minerals: Inorganic elements which contribute to metabolic functions



- **Calcium**
- Chromium
- Copper
- Iodine
- Iron
- **Magnesium**

- Phosphorus
- *Potassium*
- *Selenium*
- Sodium
- *Zinc*





Water

- What does it do?
- Recent Research
- Amounts Needed
 - 64oz+
 - Exercise
 - Altitude
- Hyponatremia

Fiber

- Soluble
- Insoluble
- Amounts Desired

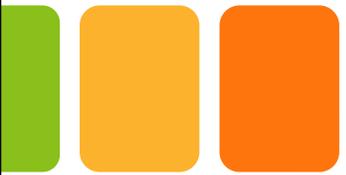




Summary

- Vitamins, Minerals, and Water as an Important Part of Health
- Amounts and Supplements
- Best Sources are Still from Foods





Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E

Assessment



Metabolic Rate

*Factors of BMR

- Age
- Gender
- Hormone Balance
- Thermal Effect of Food
- Nutrient Absorption Efficiency
- Activity Level*
- Body Composition
- Climate



BMR Calculations

Harris / Benedict Equation



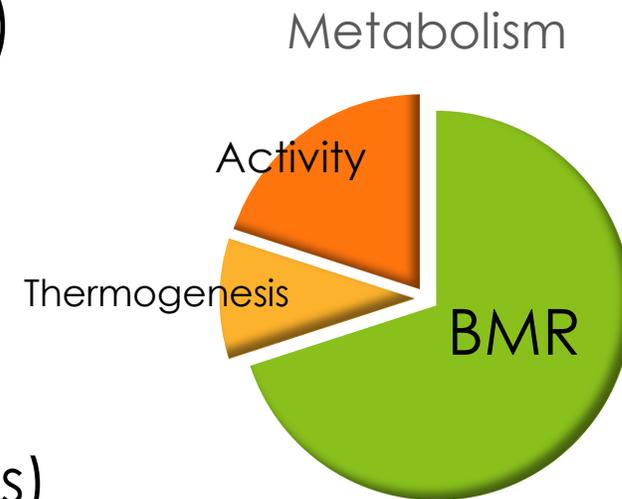
Male

$$655 + (4.35 \times \text{Weight in pounds}) \\ + (4.7 \times \text{Height inches Inches}) \\ - (4.7 \times \text{age in years}) \\ = \text{BMR}$$



Female

$$66 + (6.23 \times \text{Weight in pounds}) \\ + (12.7 \times \text{Height inches Inches}) \\ - (6.8 \times \text{age in years}) \\ = \text{BMR}$$





Assessment - Body Metabolic Analysis

Name _____ Age _____

Weight _____ lbs. _____ kgs _____

Body Fat Percentage _____ %

Fat Free Mass _____ lbs. _____ kgs _____

Fat Weight _____ lbs. _____ kgs _____

Fat Calories _____

Male

$$66.5 + 5(\text{height in cm}) + 13.7(\text{weight in kg}) - 6.75(\text{age})$$

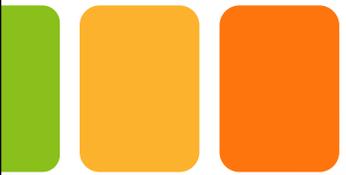
RMR= _____

Female

$$655 + 1.8(\text{height in cm}) + 9.5(\text{weight in kg}) - 4.6(\text{age})$$

RMR= _____





Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E

Program
Design





Major Energy Producing Systems

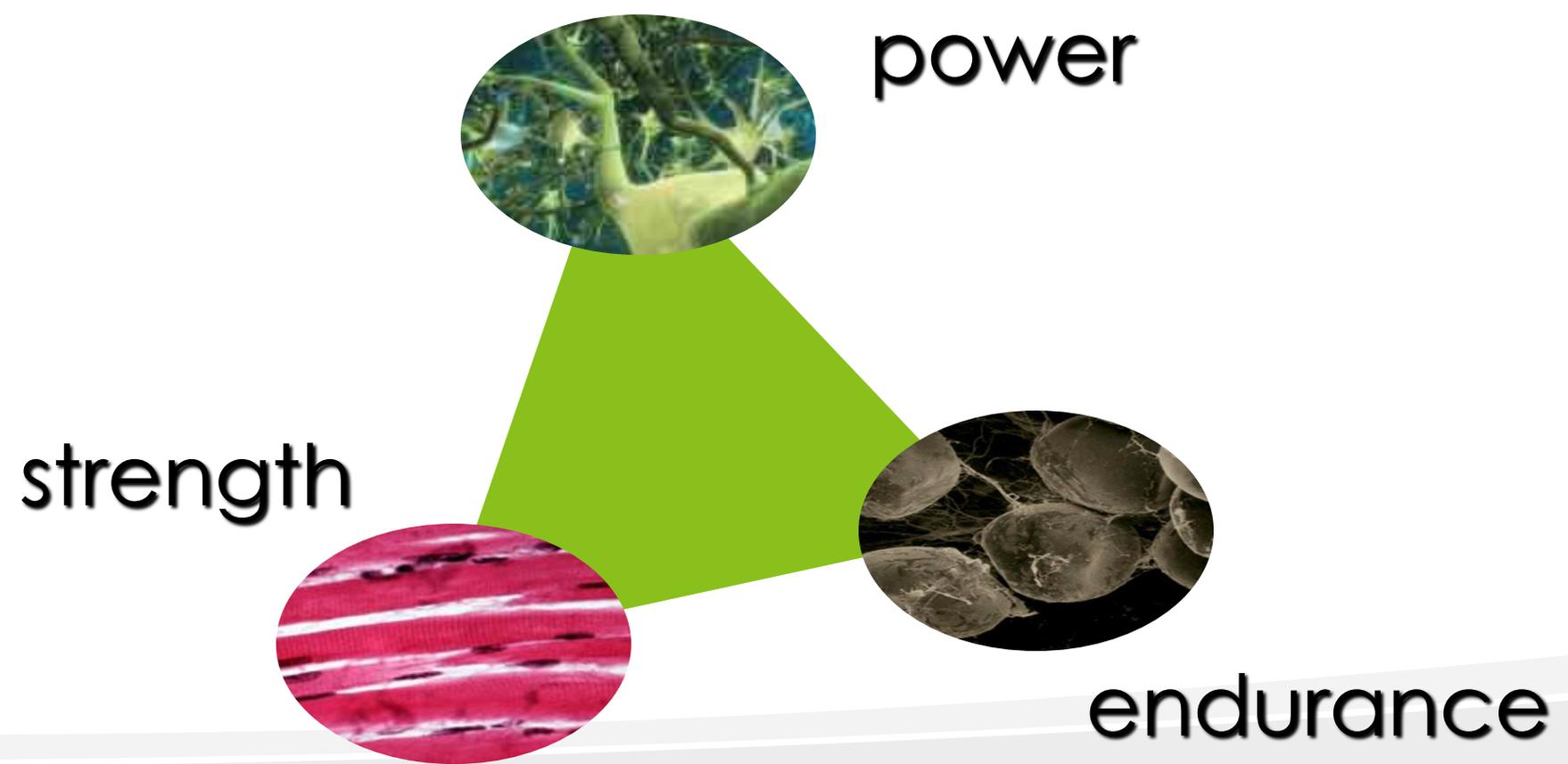


	Substrate	Oxygen Required	Speed of ATP	Total ATP Production
ATP - CP <30 sec	<i>Stored Phosphagens</i>	<i>No</i>	<i>Fast</i>	<i>Very Limited</i>
Anaerobic <3 min	<i>Glucose and Glycogen</i>	<i>No</i>	<i>Fast</i>	<i>Limited</i>
Aerobic 3+ min	<i>Glucose, Glycogen, Protein, & Fat</i>	<i>Yes</i>	<i>Slow</i>	<i>Essentially Unlimited</i>





What Make Them Go!





Krebs Cycle

Happens in the mitochondria

ATP - CP

Glycolosis

No ATP Produced

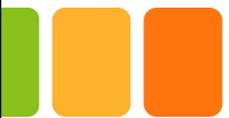
2 ATP Produced

36 ATP Produced



38 Total ATP Produced





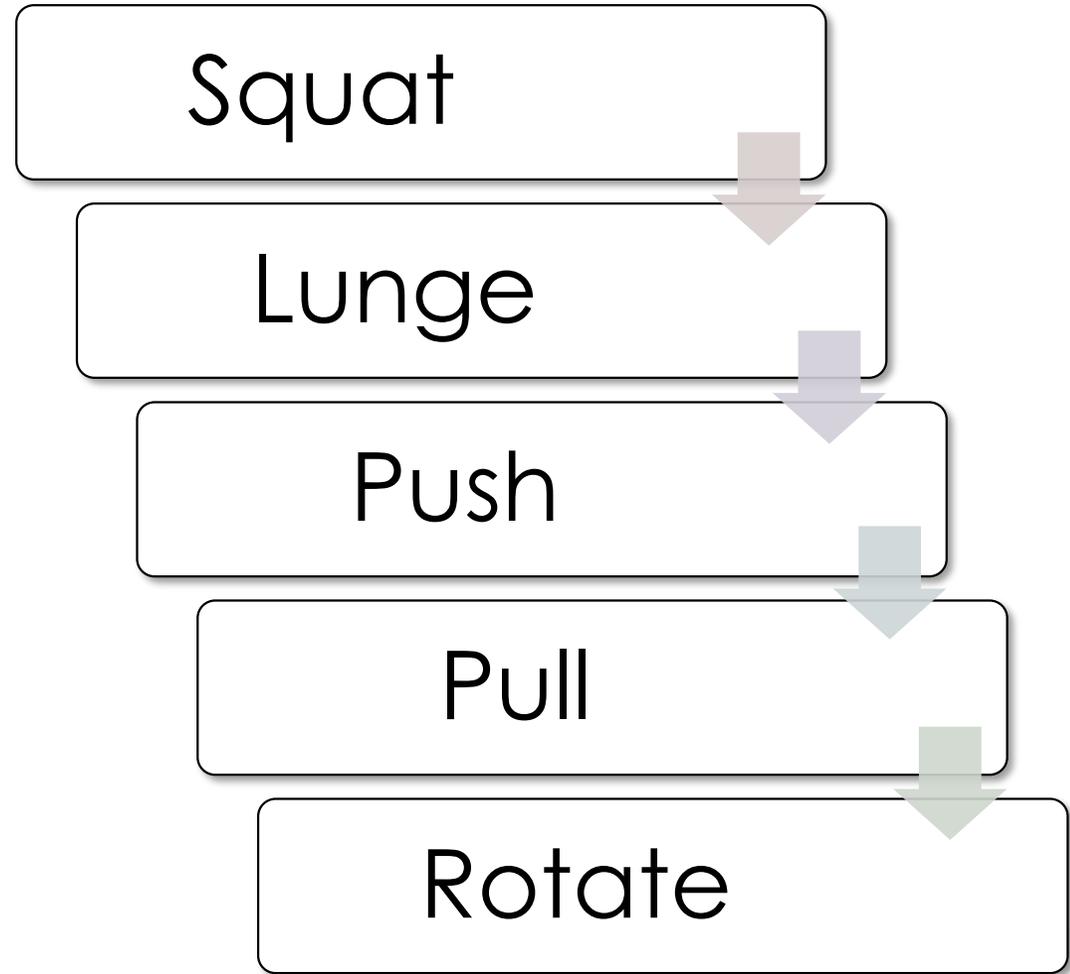
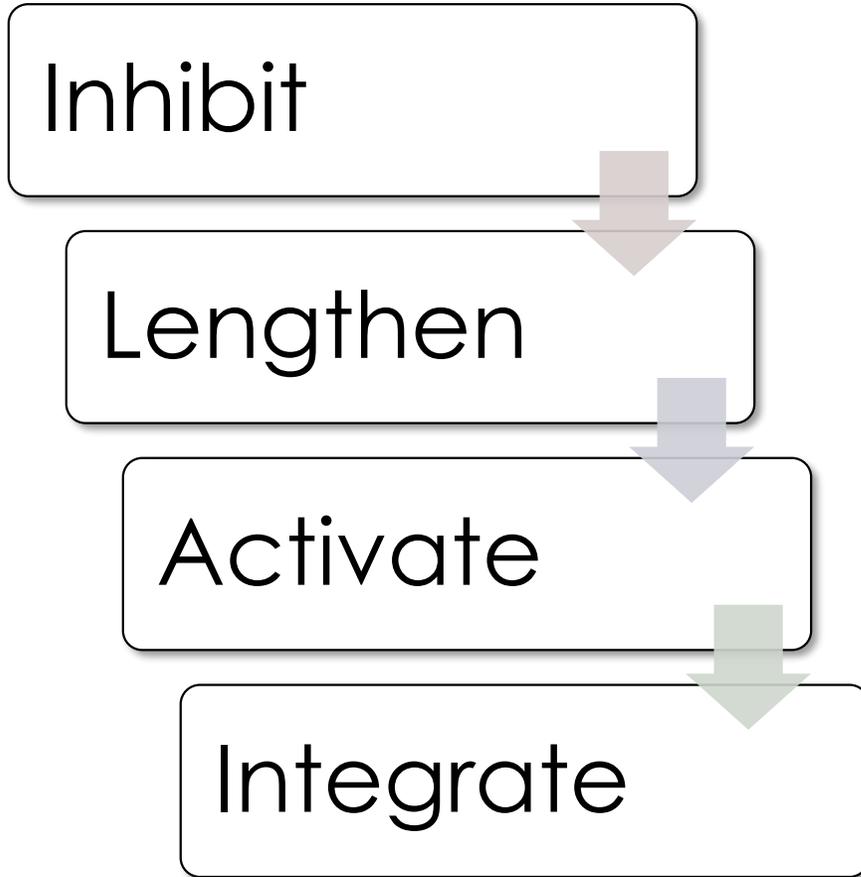
Protein Recommendations

- Weight maintenance .8 to 1 grams / kgs
- Weight Gain 1.2 to 2 grams / kgs
- Notes:
 - Never less than 75 grams / day





Rxercise Bout



Example Program

- 200 min* / week
 - 160 min @ 11-12 RPE
 - 20 min @ 13-15 RPE
 - 20 min @ 16-17 RPE



Sample Weeks Workouts

- 4 workouts X 40 min @ 11-12 RPE
- 1 X 20 min Tempo @ 13-15 RPE
- 1 X 20 min* Intervals @ 16-17 RPE

*ACSM recommendation changes



Rate of Perceived Exertion



		Level 1	Watching TV – not a scary program
4		Level 2	Easy all day pace
5-6		Level 3	Breathing a bit harder but still comfortable
7-8		Level 4	Starting to sweat, still able to effortlessly converse
9-10		Level 5	Sweating, talking, and feeling good
11-12		Level 6	Working hard, but can hold light conversation
13-15		Level 7	Working very hard, can still talk, but only to yourself
16-17		Level 8	Working so hard can only grunt, did I mention sweat
18-19		Level 9	Talking to your creator
20		Level 10	Making deals with creator, all out!



ATP Utilization*

High Intensity

Low Intensity



Glucose

Fatty Acids

Amino Acids

*per unit time

Mike Rickett 2020 ©

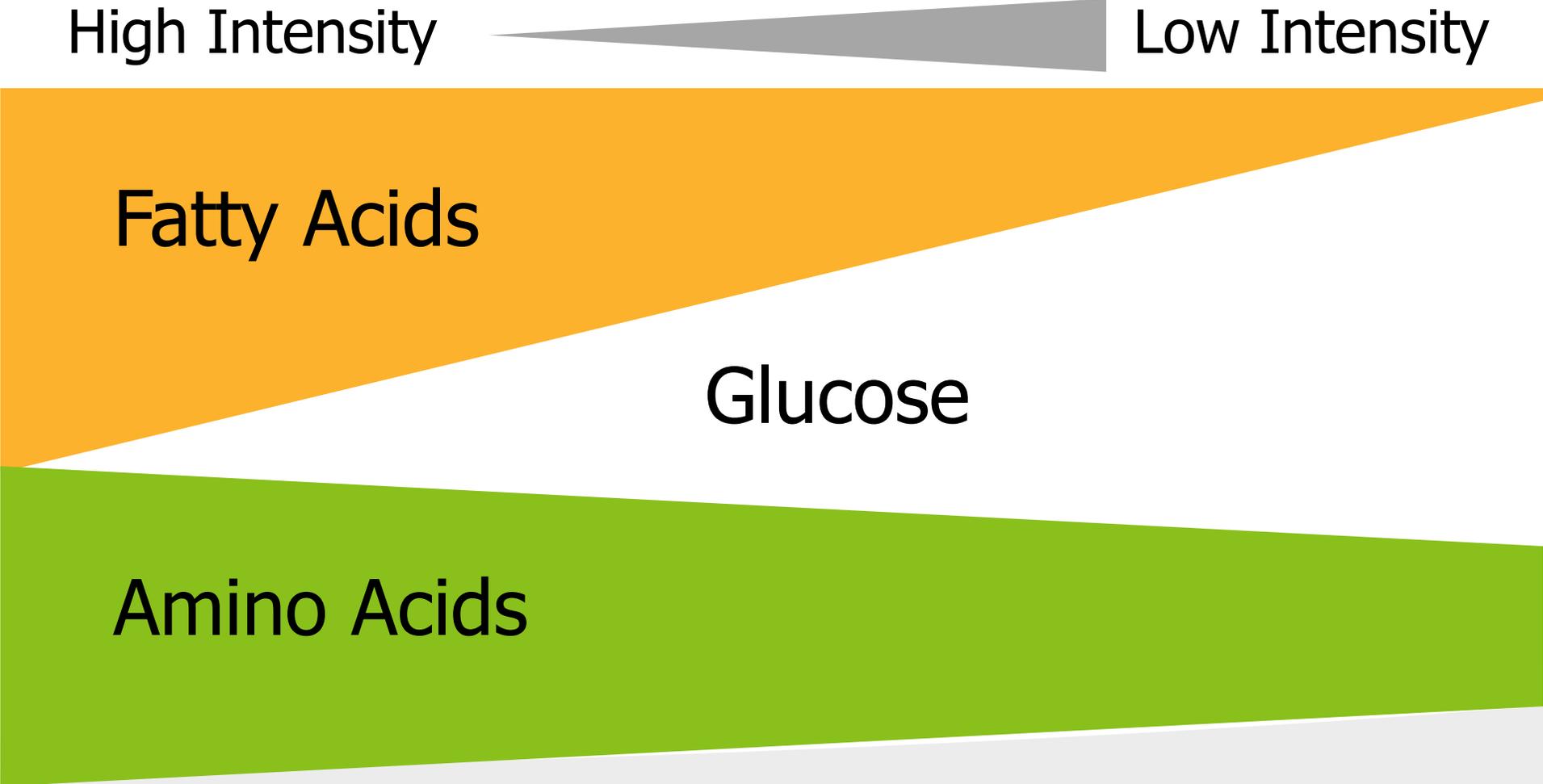




ATP Recovery

High Intensity

Low Intensity



Fatty Acids

Glucose

Amino Acids





Disordered Eating

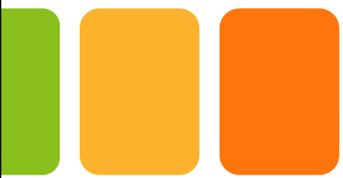
- Anorexia Nervosa
- Anorexia Athletica
- Bulimia Nervosa
- Binge Eating Disorder
- Orthorexia
- Female Athlete Triad
- More information:

- Diagnostic and Statistical Manual, Fourth Edition (DSM IV™).
Washington, DC American Psychiatric Association, 2000.
- ANRED www.anred.com

Female Triad

- Disordered Eating
- Amenorrhea
- Osteopenia to Osteoporosis





Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E

Super
Supplements





STEREROIDS

How they work...

How anabolic steroids work

Anabolic steroids are synthetic derivatives of testosterone, the male sex hormone. Taken in conjunction with a high-protein diet and high-level exercise regimen, anabolic steroids can improve an athlete's strength, speed and endurance. They also help athletes work harder and recover in a shorter time.

How they work in the body

1. Anabolic steroids are administered orally or intravenously.
2. They are absorbed by muscle cells from the bloodstream.
3. Molecules fit themselves into "receptor sites" inside the muscle cell, just as a key fits into a lock.
4. If fitted with the right type, they promote the production of protein, which stimulates muscle growth.

Side effects

- Acne
- Heart damage
- Liver damage
- Increased muscle mass and weight
- Increased sex drive
- Masculinization of females; feminization of males
- Sex changes

Original purpose:

- ▶ Hormonal replacement
- ▶ Treating war casualties
- ▶ Malnourishment

Source: USA TODAY research, National Institute on Drug Abuse, Dr. Gary I. Wadler, MD

By Robert W. Ahrens, USA TODAY



Popular Supplements

- Banned Substances
 - DHEA, Androstenedione, etc.
- HGH
- Testosterone
- Thermogenic Agents
- Creatine
- Glucosamine
- Melatonin
- Caffeine
- Phenols





Popular Performance Enhancing Drugs: Prescription

Substance	Benefit	Users	Side Effects	Original Purpose
Stimulants	Increases motor activity	speed, power, endurance	Excessive energy expenditure	
Steroids	Muscle growth	speed, power, hypertrophy	Masculinization of females Feminization of males to start	
Testosterone	Muscle growth	speed, power, hypertrophy	Masculinization of females Feminization of males to start	
HGH	Muscle growth	speed, power, hypertrophy	Giantism	
EPO	Increases red blood ability to transport O₂	endurance	Thickening of blood	
DPO	Increases red blood ability to transport O₂	endurance	Thickening of blood	



Popular Performance Enhancing Drugs: Over the Counter

Substance	Benefit	Users	Side Effects	Original Purpose
Creatine	Increase LBM?	speed, power, hypertrophy	Dehydration, cramping	
Andro	Muscle growth	speed, power, endurance hypertrophy	Masculinization of females Feminization of males to start	
HMB	Muscle growth	speed, power, hypertrophy, testosterone poisoned men	Masculinization of females Feminization of males to start	
DHEA	Muscle growth	speed, power, hypertrophy, testosterone poisoned men	Masculinization of females Feminization of males to start	
Ephedrine	Weight Loss	Virtually All walks of life	Shakes, increased Blood Pressure, Anxiety	
Glucosamine	Joint Pain Reduction	People with Joint Pain	Diabetics	
Caffeine	Increased Awareness	speed, power, hypertrophy, generally everybody	Shakes, increased Blood Pressure, Anxiety	
Melatonin	Aids in Sleep	People who have problems with sleeping	Addiction Depression	



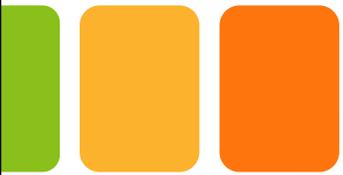
RDA Position



Best Sources
Foods or
Balanced Diet

How
Revolutionary!





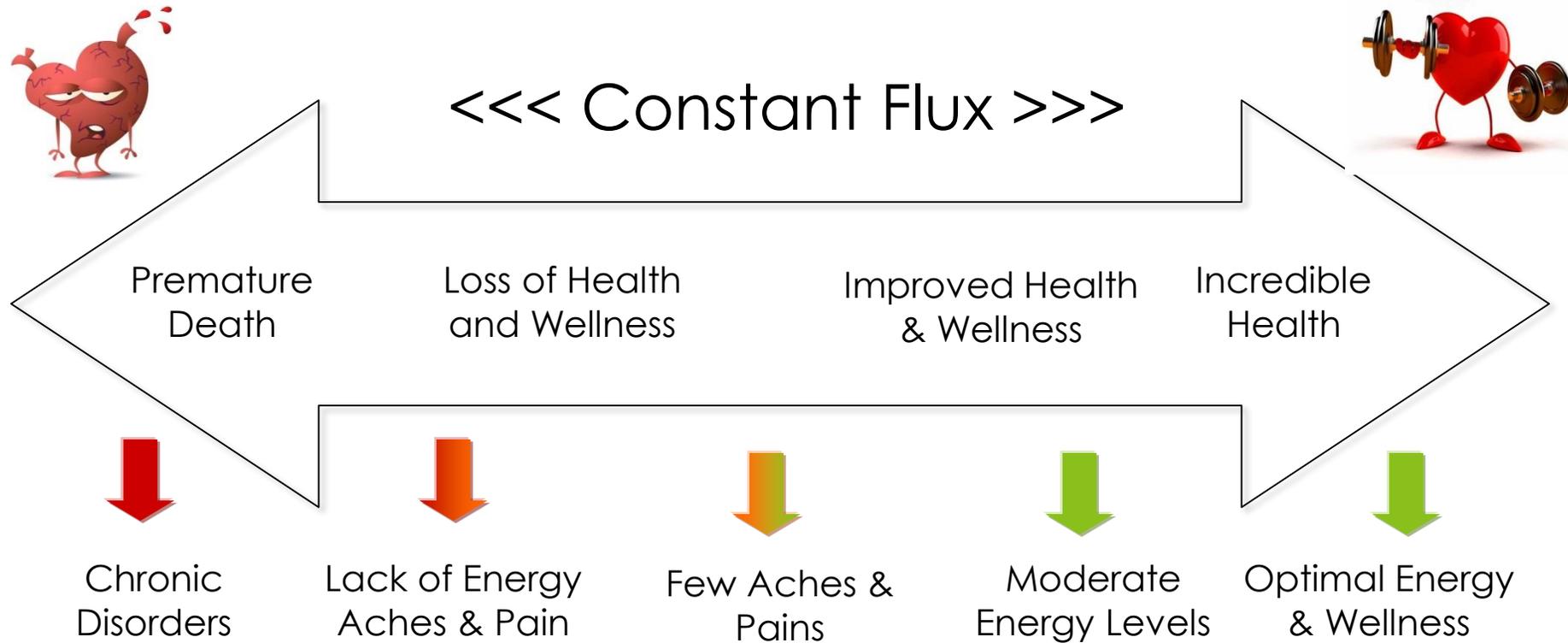
Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E

Perfect Health



Health Continuum



Health – Optimal Physical, Mental and Emotional Well Being



Diets in Common

Mediterranean



Paleo



Whole Veggies & Fruits

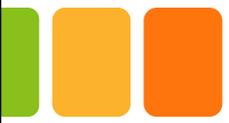
Eliminate Junk Food

Decrease Portions

No Dairy

Whole Food Plant Based





Current Dietary Concerns

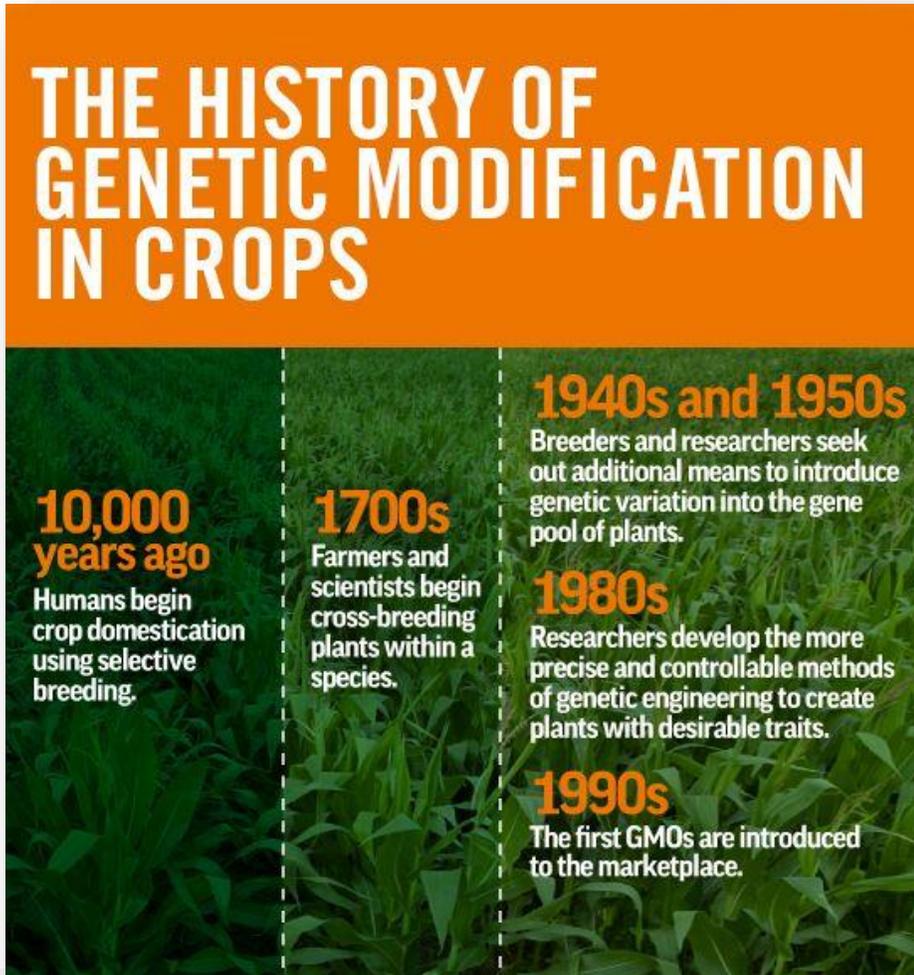
- Celiac disease
- Gluten intolerance
 - **gliadin** (prolamin protein)
 - **glutenin** (glutelin protein)
- Fructose intolerance?





The “In” Terms

- Natural
- Organic
- GMO's
- Free Range
- “Clean”



THE HISTORY OF GENETIC MODIFICATION IN CROPS

10,000 years ago
Humans begin crop domestication using selective breeding.

1700s
Farmers and scientists begin cross-breeding plants within a species.

1940s and 1950s
Breeders and researchers seek out additional means to introduce genetic variation into the gene pool of plants.

1980s
Researchers develop the more precise and controllable methods of genetic engineering to create plants with desirable traits.

1990s
The first GMOs are introduced to the marketplace.



Weight Management Protocol - Made Simple

Gain	Male	Female
Calories / kg	52	44 - 52
Calories / lb.	24	20 - 24

Loss	Male	Female
Calories / kg	33	30
Calories / lb.	15	14



Maintenance	Male	Female
Calories / kg	44	38 - 44
Calories / lb.	20	17 - 20

Kleiner, SM. *Power Eating – Build Muscle, Boost Energy, Cut Fat*. Human Kinetics Publishers 2001.





Syndrome **X** and the Future of Weight Management

- Characteristics
 - Abdominal Obesity > 40" Male / 35" female
 - Hypertriglyceridemia \geq 150 mg/dl
 - Low HDL , < 50 mg/dl for males / < **50**mg/dl for females
 - Hypertension 140/90 mmHg or on meds
 - High Fasting Glucose \geq 110 mg/dl or
 - on anti-diabetic meds
 - 25% of men and women already show signs
 - Of those born in 2000-2003, a third+ will be diabetic by 2015
- **2019 CDC Update... 40%+ are diabetic or show signs**

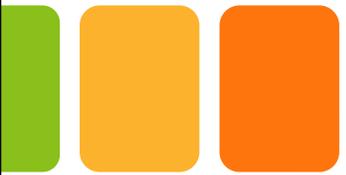




Healthy Guidelines

1. Increase Water
2. Decrease
Saturated and Hydrogenated Fats,
High Fructose Corn Syrup, & Aspartame
3. Increase Fiber
4. Eat a Variety of Foods
5. Move!





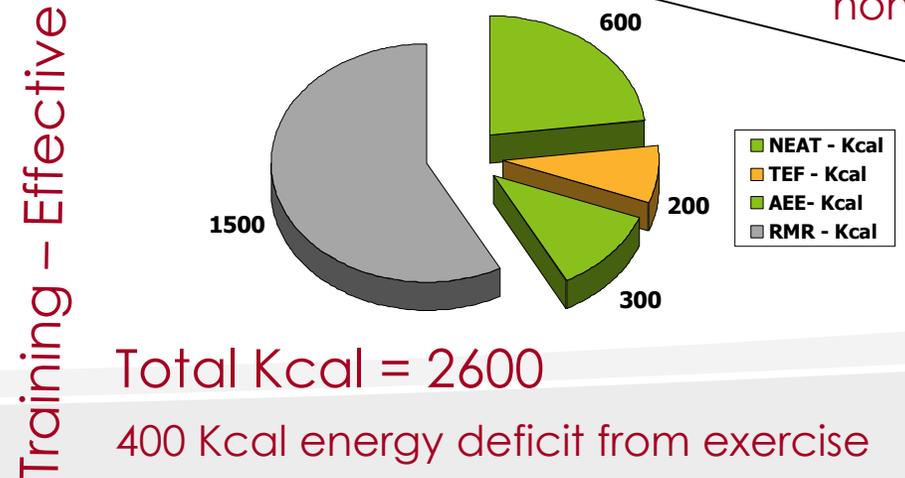
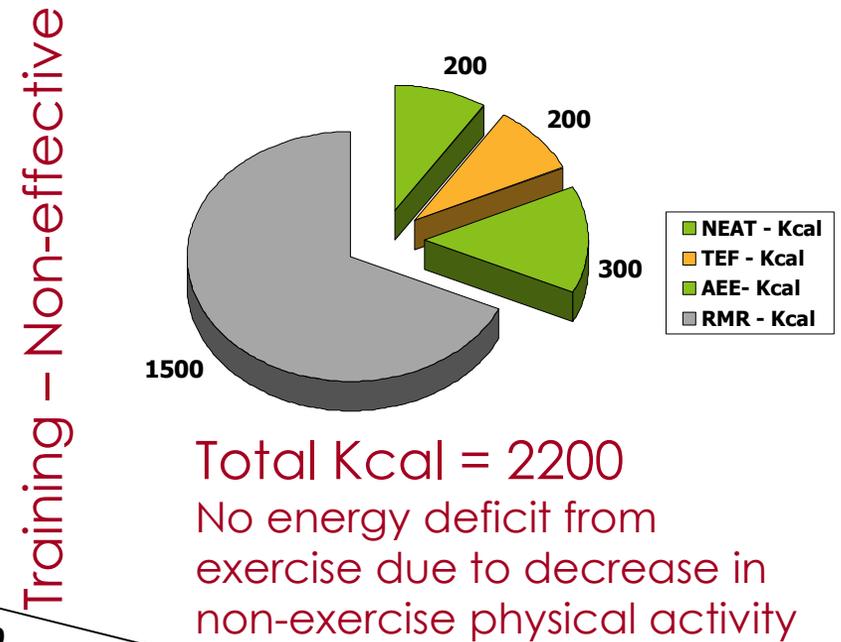
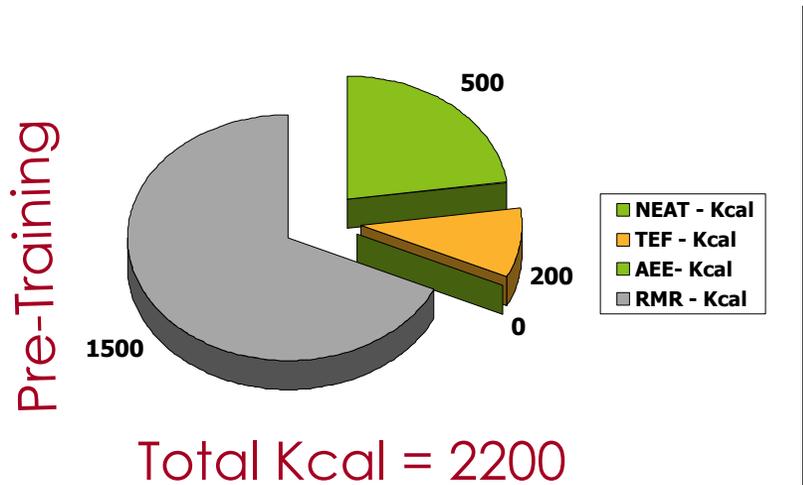
Sports Nutrition

Mike Rickett MS, CSCS*D, CSPS*D, RCPT*E

Research
Update



Total Daily Energy Expenditure



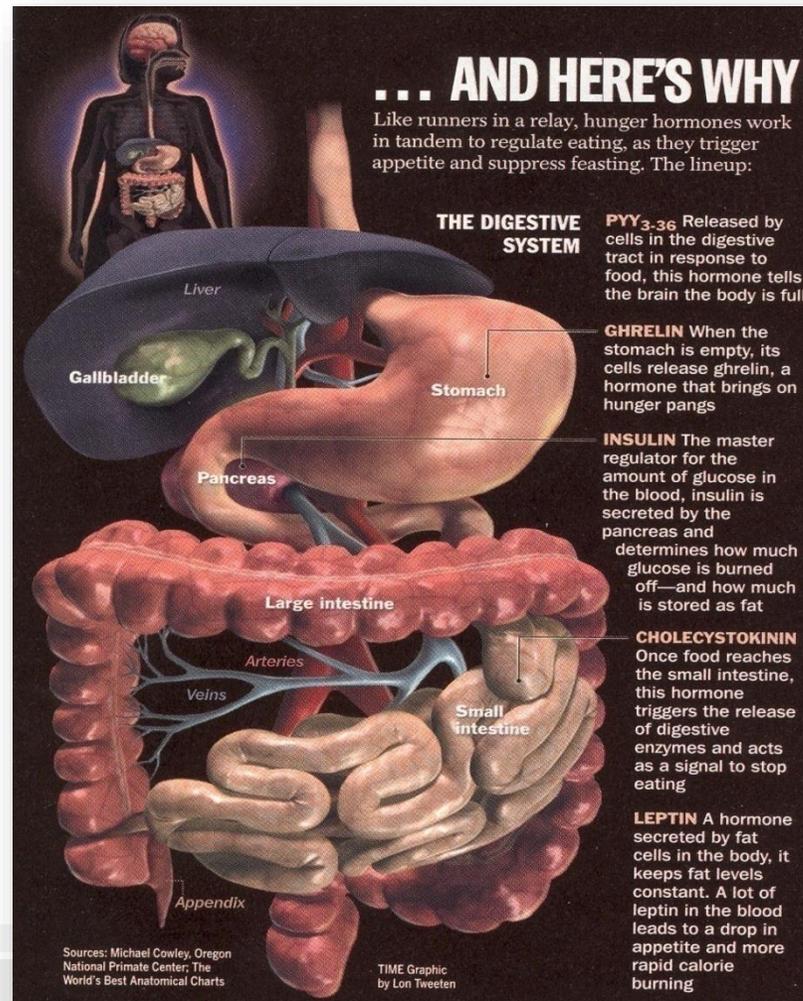


Surge in Childhood Diabetes

- Between 8% - 45% of newly diagnosed cases of childhood diabetes are type II, associated with obesity. (now 50%-65%)
- Whereas 4% of Childhood diabetes was type II in 1990, that number has risen to approximately 20% (40%)
- Type II most frequent in 10-19 group and the racial/ethnic mix of group stated
- Of Children diagnosed with Type II diabetes, 85% are obese



Hormones!!!!!!!



- PYY3-36
 - digestive tract
- Ghrelin
 - stomach
- Insulin
 - pancreas
- Cholecystokinin
 - small intestine
- Leptin
 - fat cells





How to Contact Me:

Mike Rickett MS, CSCS*D, CSPS, NSCA-CPT
1116 South Hillcrest Drive
Fort Collins CO 80521
970-484-8847



Web Site: www.mikerickett.com
e-mail: mike@mikerickett.com
Instagram: [mrickett6069](https://www.instagram.com/mrickett6069)

