

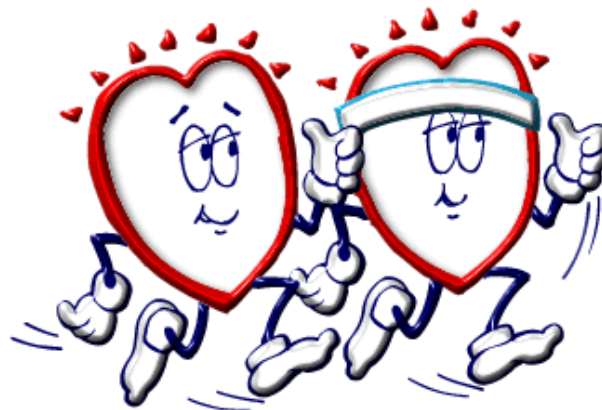


# Food for Fuel: Using nutrition to your advantage

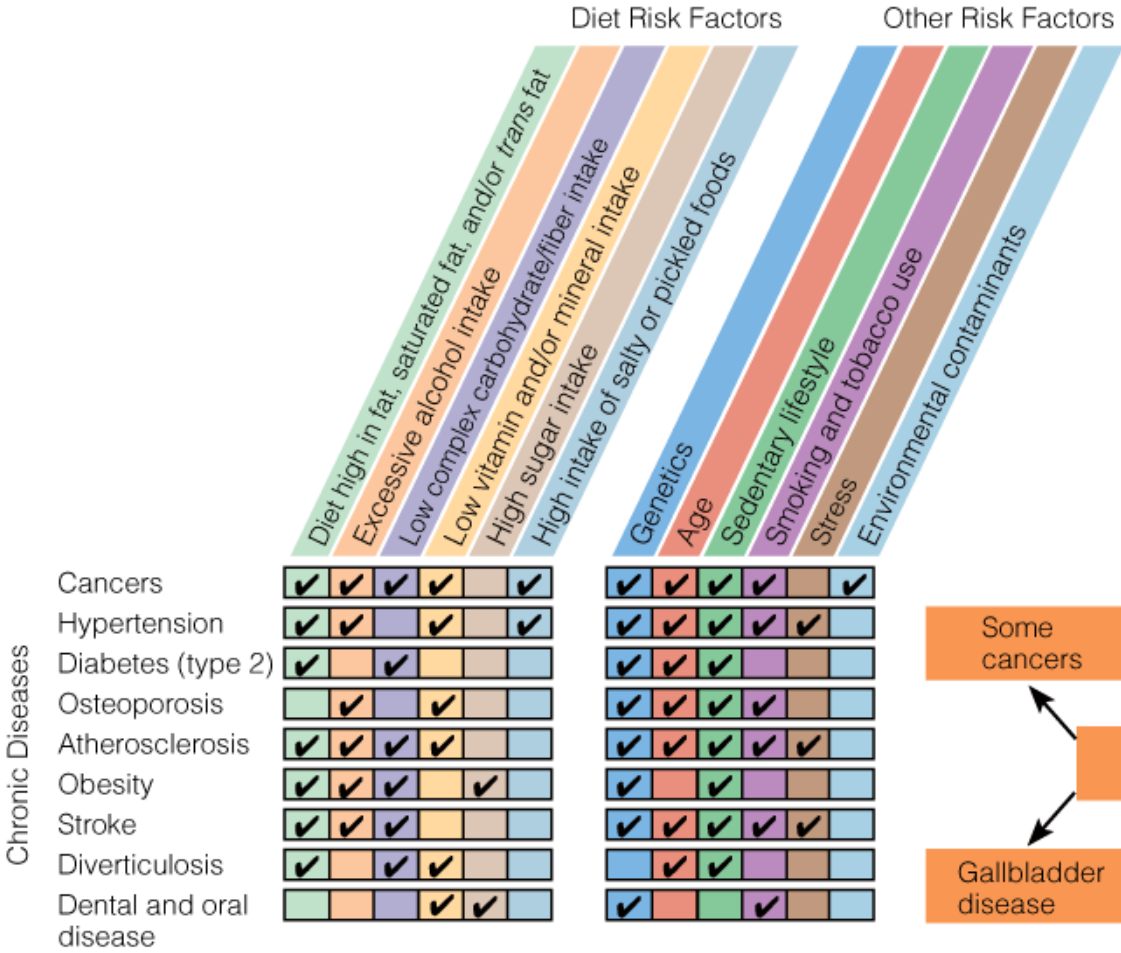
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# Why Exercise?

- More energy
- Helps with stress
- Lowers depression
- Lowers: blood pressure, cholesterol, triglycerides
- Raises: good cholesterol, mood
- Improves bone density
- Blood sugar control - = medicine for diabetes
- Builds muscle



# The Power of Exercise



# Who doesn't want to be younger?




- EPIC study found 4 behaviors to reduce risk and 'turn back the clock'
  - Don't smoke
  - Maintain healthy weight
  - **Exercise – about 30 min/day**
  - Eat more whole plant foods and less meat
- Cuts risk by 78%
- Equal to being 14 years younger

# Goals of Nutrition during Exercise

- Good nutrition helps with:
  - Physical activity
  - Athletic performance
  - Recovery
- Adequate food and fluid should be consumed before, during, and after exercise to help:
  - maintain blood glucose levels
  - maximize performance
  - improve recovery time.

# Components of Fitness

**TABLE 14-2 Guidelines for Physical Fitness**

	Cardiorespiratory	Strength	Flexibility
			
<b>Type of Activity</b>	Aerobic activity that uses large-muscle groups and can be maintained continuously	Resistance activity that is performed at a controlled speed and through a full range of motion	Stretching activity that uses the major muscle groups
<b>Frequency</b>	5 to 7 days per week	2 or more nonconsecutive days per week	2 to 7 days per week
<b>Intensity</b>	Moderate (equivalent to walking at a pace of 3 to 4 miles per hour) <sup>a</sup>	Enough to enhance muscle strength and improve body composition	Enough to develop and maintain a full range of motion
<b>Duration</b>	At least 30 minutes	8 to 12 repetitions of 8 to 10 different exercises (minimum)	2 to 4 repetitions of 15 to 30 seconds per muscle group
<b>Examples</b>	Running, cycling, swimming, inline skating, rowing, power walking, cross-country skiing, kickboxing, jumping rope; sports activities such as basketball, soccer, racquetball, tennis, volleyball	Pull-ups, push-ups, weight lifting, pilates	Yoga

<sup>a</sup>For those who prefer vigorous-intensity aerobic activity such as walking at a very brisk pace (>4.5 mph) or running (≥5 mph), a minimum of 20 minutes per day, 3 days per week is recommended.  
SOURCE: Adapted from W. L. Haskell and coauthors, Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association, *Medicine & Science in Sports & Exercise* 39 (2007): 1423–1434.

# Calorie/Energy Needs



- Depend on:
  - Type of exercise, duration, frequency, intensity
  - Gender
  - Heredity
  - Age
  - Body size
  - Body Composition (Fat Free Mass -FFM)
  - Prior nutrition status
- To determine specific energy needs, sports dietitians use Harris-Benedict equation

# Initial Fuels for Exercise

- Adenosine triphosphate (ATP)
  - Small amounts in all body tissues all the time
  - Delivers energy instantly
- Creatine phosphate (CP)
  - Stored in the muscles
  - Break down begins before ATP pools dwindle



# Fuels for Exercise

- Energy-producing nutrients
  - Carbohydrate, protein, fat
  - Factors influencing fuel use
    - Usual diet, intensity & duration of activity, training
  - Anaerobic activities – use mainly glucose
  - Aerobic/Endurance activities – use mainly fats

# Target Heart Rate

- Working in target range ensures you are in 'fat burning zone'
- May need MD to help you figure yours
- Rule of thumb:
  - $220 - \text{age} = \text{Maximum Heart Rate}$
  - 50% - 70% of Maximum Heart Rate = Target Heart Rate (moderate activity)
  - 60-80% of Maximum Heart Rate = Target Heart Rate (vigorous activity)
- For 50 yo
- $220 - 50 = 170 \times .5 \ \& \ .7 = 85 - 119$  Target Heart Rate

# Fuels Used for Activities



**TABLE 14-4 Fuels Used for Activities of Different Intensities and Durations**

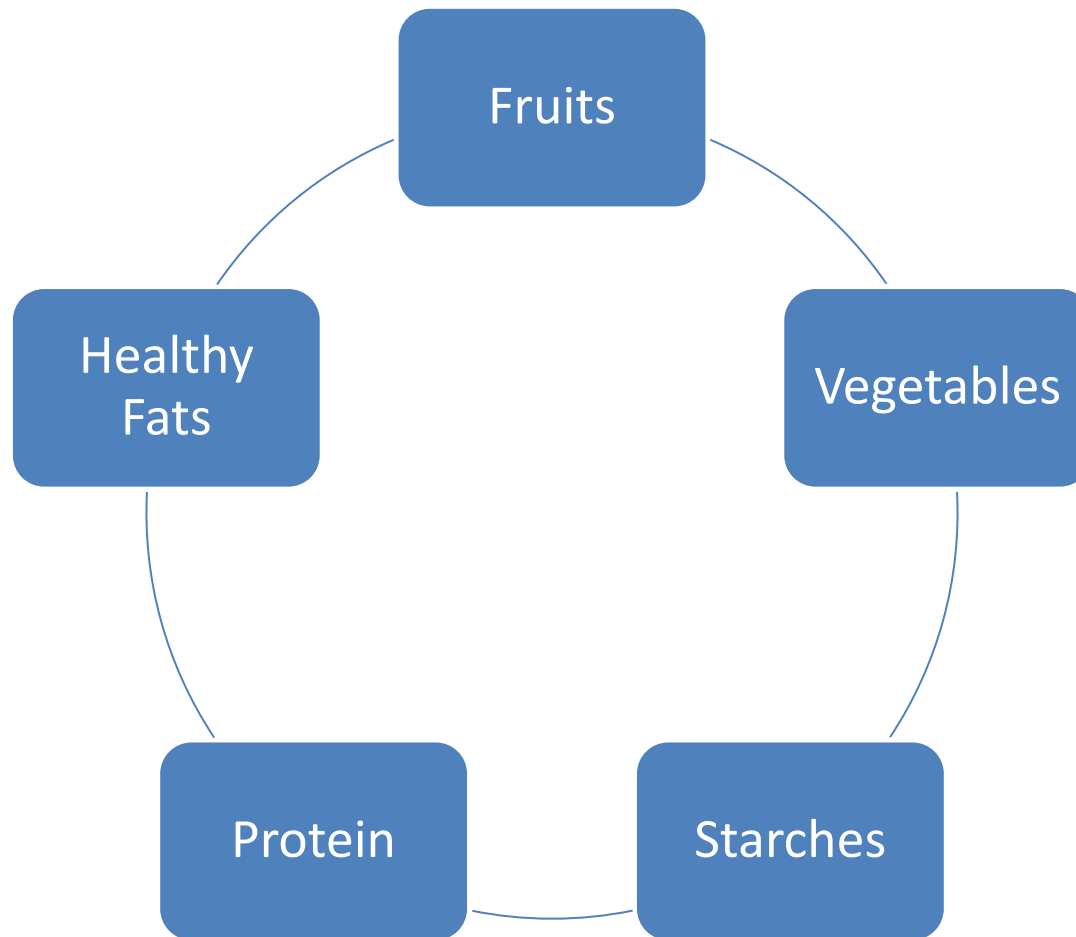
Activity Intensity	Activity Duration	Preferred Fuel Source	Oxygen Needed?	Activity Example
Extreme <sup>a</sup>	8 to 10 sec	ATP-CP (immediate availability)	No (anaerobic)	100-yard dash, shot put
Very high	20 sec to 3 min	ATP from carbohydrate (lactate)	No (anaerobic)	¼-mile run at maximal speed
High	3 min to 20 min	ATP from carbohydrate	Yes (aerobic)	Cycling, swimming, or running
Moderate	More than 20 min	ATP from fat	Yes (aerobic)	Hiking

<sup>a</sup>All levels of activity intensity use the ATP-CP system initially; extremely intense short-term activities rely solely on the ATP-CP system.

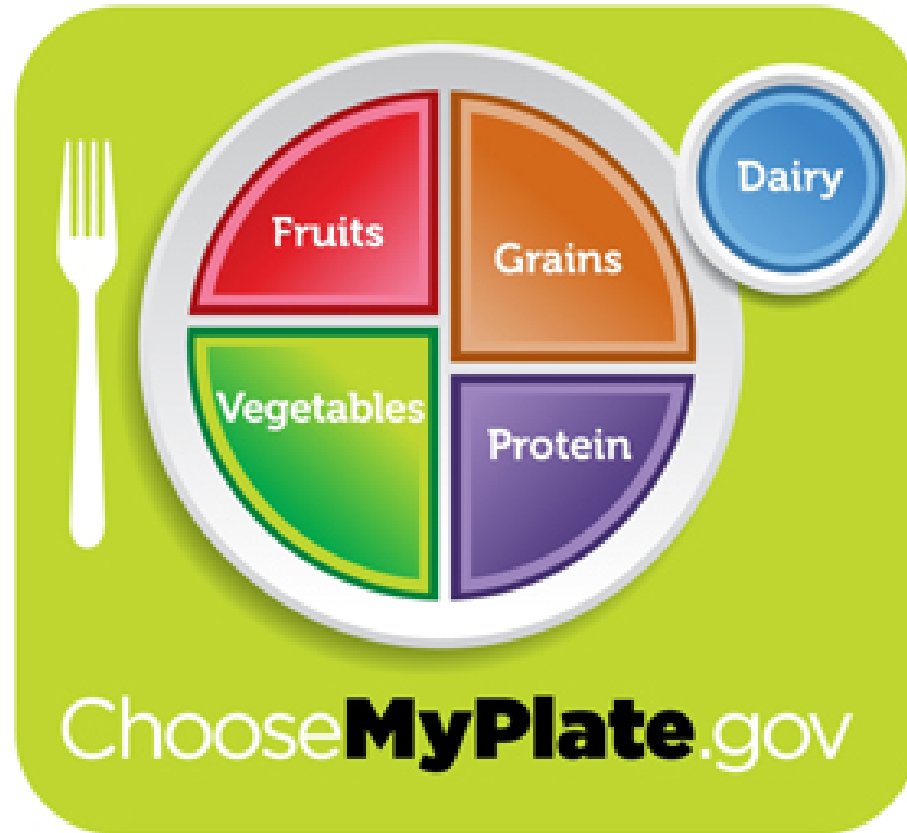
# A High-Carb diet improves performance



# Food Groups for Fitness



# When in doubt, use your plate



# Carbohydrates

- Carbohydrate recommendations range from 6-10 g/kg body weight per day
- Function: maintain blood glucose levels and replace muscle glycogen
- 150 lb person = 400-700 grams carb/day
- Choose less processed, high fiber, good quality carbs
  - Whole grains and starches
  - Milk & Yogurt
  - Fresh fruits & veggies



# Protein

Function: Repair and build tissue , energy needs

**TABLE 14-5 Recommended Protein Intakes for Athletes**

	Recommendations (g/kg/day)	Protein Intakes (g/day)	
		Males	Females
RDA for adults	0.8	56	44
Recommended intake for power (strength or speed) athletes	1.2–1.7	84–119	66–94
Recommended intake for endurance athletes	1.2–1.4	84–98	66–77
U.S. average intake		102	70

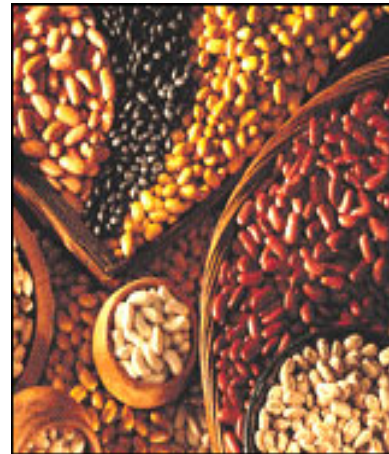
NOTE: Daily protein intakes are based on a 70-kilogram (154-pound) man and 55-kilogram (121-pound) woman.

SOURCES: U.S. Department of Agriculture, Agricultural Research Service, 2008. Nutrient Intakes from Food: Mean Amounts Consumed per Individual, One Day, 2005–2006. Available: [www.ars.usda.gov/ba/bhnrc/fsrg](http://www.ars.usda.gov/ba/bhnrc/fsrg); Committee on Dietary Reference Intakes, *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein and Amino Acids* (Washington, D.C.: National Academies Press, 2005), pp. 660–661; Position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine: Nutrition and athletic performance, *Journal of the American Dietetic Association* 109 (2009): 509–527.



# Protein Sources

- Animal proteins:
  - Eggs
  - Meat & fish
  - Dairy: milk, yogurt, cottage cheese, cheese
- Plant proteins:
  - Soy
  - Quinoa
  - Beans, legumes
  - Nuts, seeds
  - Grains



# Fat

- Fat intake should range from 20-30% of total energy intake
- Function: to provide adequate energy, fat-soluble vitamins, and essential fatty acids
- Choose healthy fats, limit saturated fats
  - Olive, canola, peanut oils
  - Nuts, olives, avocado
  - Omega 3 fatty acids: flax, walnuts, fatty fish



# Nutrition Before Exercise

- Goals: adequate hydration, provide carbohydrate to maintain blood glucose, minimize GI problems
- Carb-rich snack or meal before exercise
- Include a little protein
- Choose low fat and fiber to help with digestion closer to your activity
- Practice!



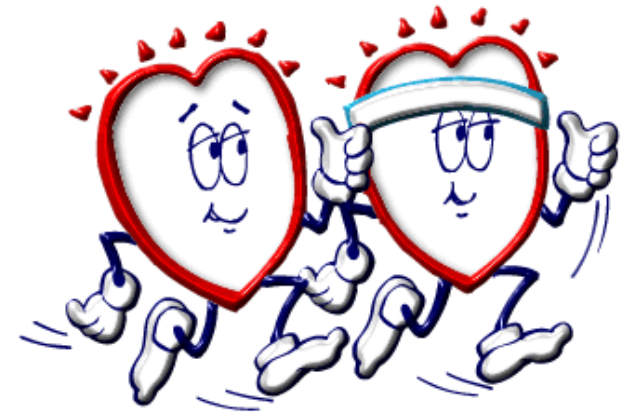
# Pre-exercise Foods



- 3-4 hours before:
  - Peanut butter on toast + milk/soy milk
  - Fruit & yogurt smoothie + granola
  - Oatmeal + almonds + skim milk + banana
  - Low fat cottage cheese + grapes + crackers
  - Lean burger/veggie burger + whole grain bun + salad
  - Turkey sandwich + fruit
- Within one hour of activity:
  - Sports drink or bar
  - Fruit or toast

# Nutrition During Exercise

- Goal: replace fluid losses, provide carbohydrate for blood glucose maintenance
- Use sports drinks with carb and electrolytes for activities over 1 hour long
- For long events, may tolerate easy-to-digest foods:
  - Banana, fruit
  - Sports gels/gummies/GU
  - Bite-sized sports bars
- Practice!



# Nutrition for Recovery



- Goals:
  - Replace fluids & electrolytes (sodium and potassium)
  - Replace calories
  - Carbohydrate to replace muscle glycogen stores
  - Rapid recovery
  - Protein to repair damaged muscle tissue
- Have recovery snack or meal within 15-60 minutes of exercise
- No appetite? - try fluids

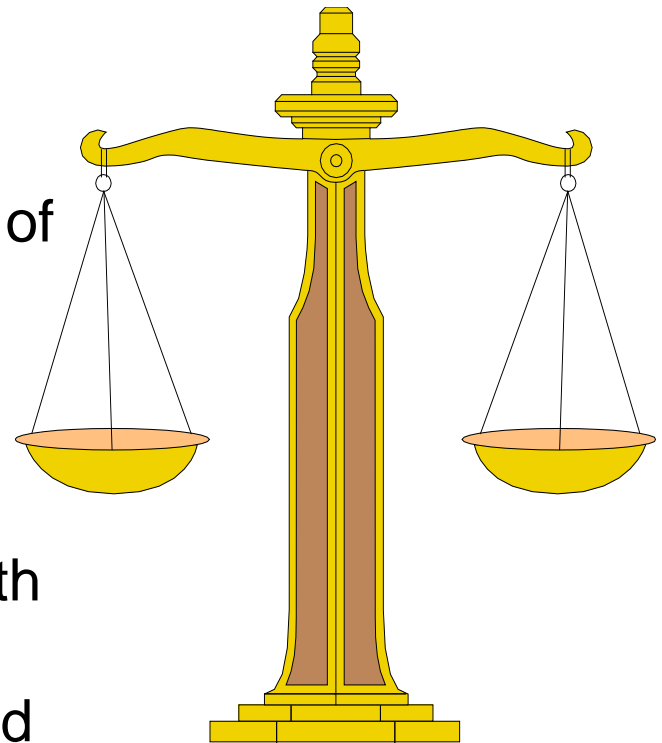
# Foods for Recovery



- Rehydration fluids
  - Sports drinks
- Recovery snacks:
  - Smoothie with yogurt and berries
  - Sports drink and sports bar
  - Graham crackers + peanut butter + milk + fruit
- Recovery Meals:
  - Sandwich on whole wheat pita + hummus + veggies + pretzels + soy milk
  - Rice bowl with beans, cheese, salsa, avocado + tortilla

# Hydration

- Goal: to prevent dehydration during exercise by replacing sweat loss
- Important to stay hydrated before, during, and after exercise
- Dehydration = loss of 2% or more of body weight
- (I.e. 200# person loses 4# after event)
- <60 min activity – water is best
- >60 min activity – sports drinks with 6-8% carb
- Gauge hydration by urine color and volume





# Sample Hydration Schedule

**TABLE 14-6** Hydration Schedule for Physical Activity

When to Drink	Amount of Fluid
2 to 3 hr before activity	2 to 3 c
15 min before activity	1 to 2 c
Every 15 min during activity	½ to 1 c (Drink enough to minimize loss of body weight, but don't overdrink.)
After activity	2 c for each pound of body weight lost <sup>a</sup>

<sup>a</sup>Drinking 2 cups of fluid every 20 to 30 minutes after exercise until the total amount required is consumed is more effective for rehydration than drinking the needed amount all at once. Rapid fluid replacement after exercise stimulates urine production and results in less body water retention.

SOURCES: Adapted from American College of Sports Medicine, Position stand, Exercise and fluid replacement, *Medicine & Science in Sports & Exercise* 39 (2007): 377–390; C. K. Seto, D. Way, and N. O'Connor, Environmental illness in athletes, *Clinics in Sports Medicine* 24 (2005): 695–718; R. Murray, Fluid, electrolytes, and exercise in *Sports Nutrition: A Practice Manual for Professionals*, 4th ed., ed. M. Dunford (Chicago: American Dietetic Association, 2006), pp. 94–115; D. J. Casa, P. M. Clarkson, and W. O. Roberts, American College of Sports Medicine Roundtable on Hydration and Physical Activity: Consensus statements, *Current Sports Medicine Reports* 4 (2005): 115–127.

# Supplements

- More protein ≠ bigger muscles
- Protein or amino acid supplementation has not been shown to improve performance
- MVI/Mineral supplements do not improve performance when a nutritionally adequate diet is consumed
- Who needs multivitamin/mineral supplement?
  - Athletes who restrict energy intake
  - Eliminate one or more food groups
  - Consume unbalanced diet or low in nutrient-density

# Nutrition and Fitness – Bottom Line

## WISE WORDS:

- “Adequate balanced diet is necessary for effective performance (but does not guarantee it because it is only one aspect of performance)”
- “A poor diet, on the other hand guarantees substandard performance”

Hultman et al., 1994





# Thank you!

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# Almond Oat Bites



Makes 8 servings (2 balls)

1 cup organic old-fashioned rolled oats  
¼ cup ground flax  
¼ cup sliced organic almonds, chopped  
2 tbsp. chia seeds  
1/8 tsp. ground cinnamon  
Pinch of sea salt  
6 tbsp. creamy, organic almond butter, melted and slightly cooled  
5 tbsp. organic honey  
¼ tsp. pure vanilla extract  
2 tbsp. mini dark chocolate chips (optional)  
¼ cup ground almonds (pulse in a food processor), to roll the balls in

- Combine oats, chopped almonds, flax, chia seeds, sea salt, and cinnamon in a large bowl.
- Melt almond butter in a saucepan over medium-to-low heat. Once almond butter has melted, remove from heat and stir in honey and vanilla.
- Once the mixture has cooled slightly, pour it over the oat mixture and mix well with a spoon. Fold in the chocolate chips.
- Roll the mixture into small bite-sized balls, about 16 balls. Then roll it into the ground almonds, coating all sides.
- Let chill in the refrigerator before eating - Enjoy!

**Optional substitutions:** unsweetened organic shredded coconut, goji berries, raisins, chopped dates, dried cranberries, dried cherries, raw/unsalted sunflower seeds, hemp seeds, walnuts, pecans, cashew, etc.

1 serving: 210 Calories, 12.3g Fat, 24.0g Carbohydrate, 6.3g Protein, 0mg Cholesterol, 1mg Sodium, 5.0 g Fiber