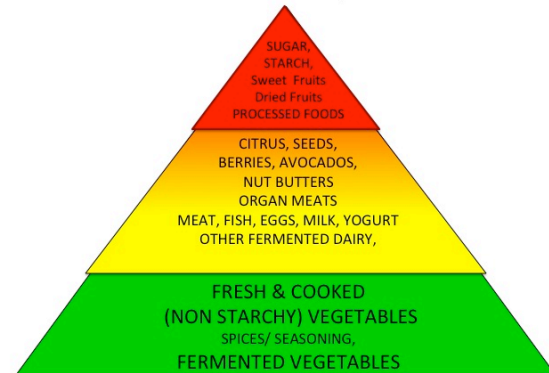


New Concepts in Nutrition

Linda M. Gourash, MD
Developmental Pediatrician
Pittsburgh, Pennsylvania

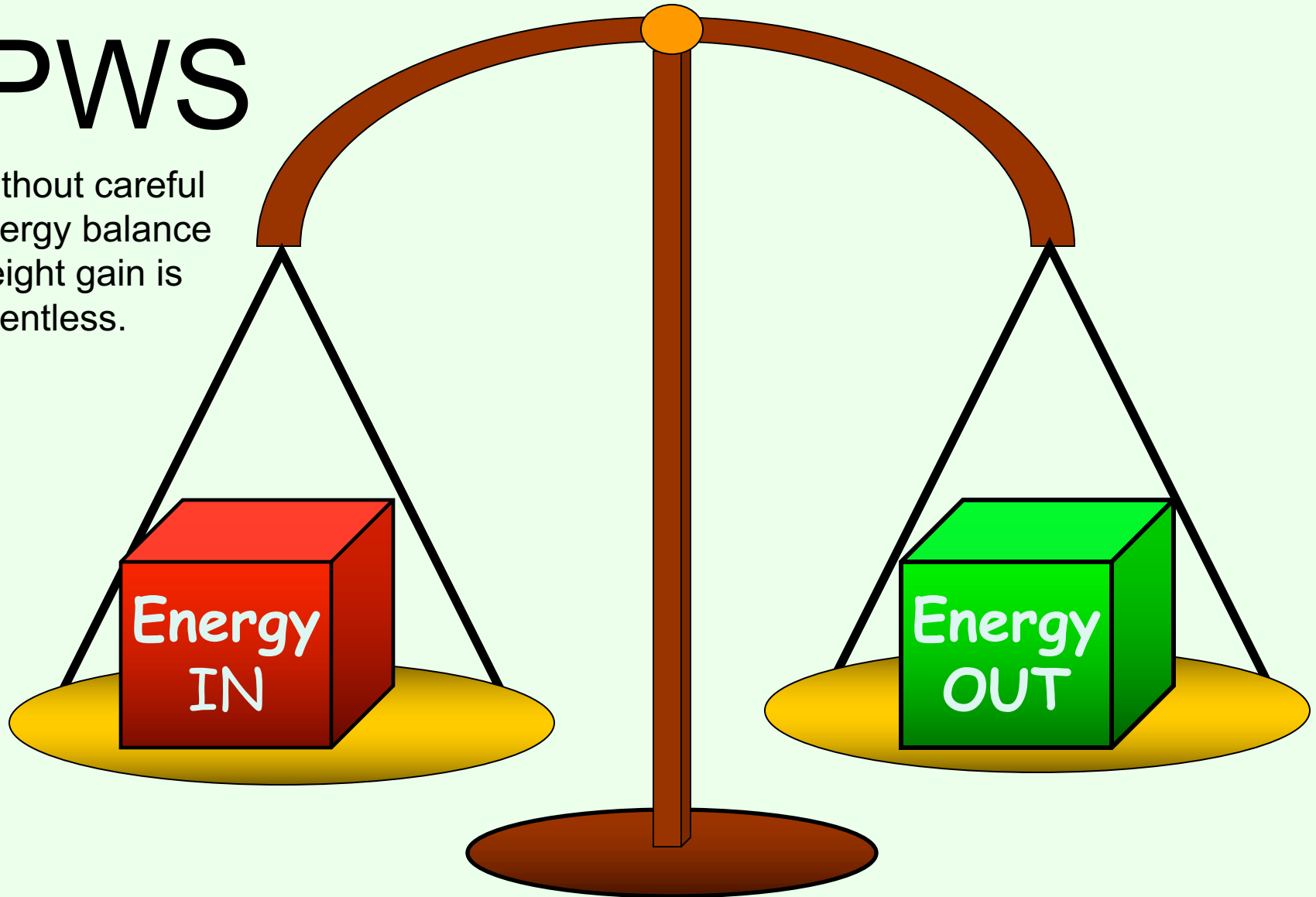


PWS Food Pyramid



PWS

Without careful
energy balance
weight gain is
relentless.



Calorie/Portion Control

**Traditional
PWS Food
Pyramid
emphasizes
calorie
control**



Problem:

While caloric needs are diminished, we cannot assume that micronutrient needs are equally diminished:
Therefore PWS Diet should maximize nutritional density:

Nutrient Density = Nutrients per Calorie

Ideal PWS Diet?

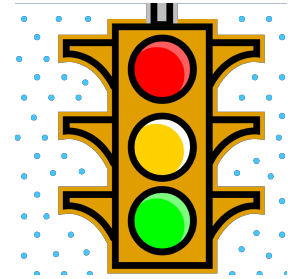
1. No one knows
2. No agreement on Ideal HUMAN Diet

Goals of a PWS Diet

- Calorie control
- Supply of essential nutrients
- Promotes gut health
 - Avoids foods that cause permeable gut barriers (beans, grains, white potatoes)
 - Promotes growth of healthy gut bacteria
 - (fermented foods; fiber)
- Limits/eliminates highly rewarding (sweet) foods
- No “free” foods even if there are zero calories because they always need external limits on everything.

Traditional Red, Yellow, Green Diet

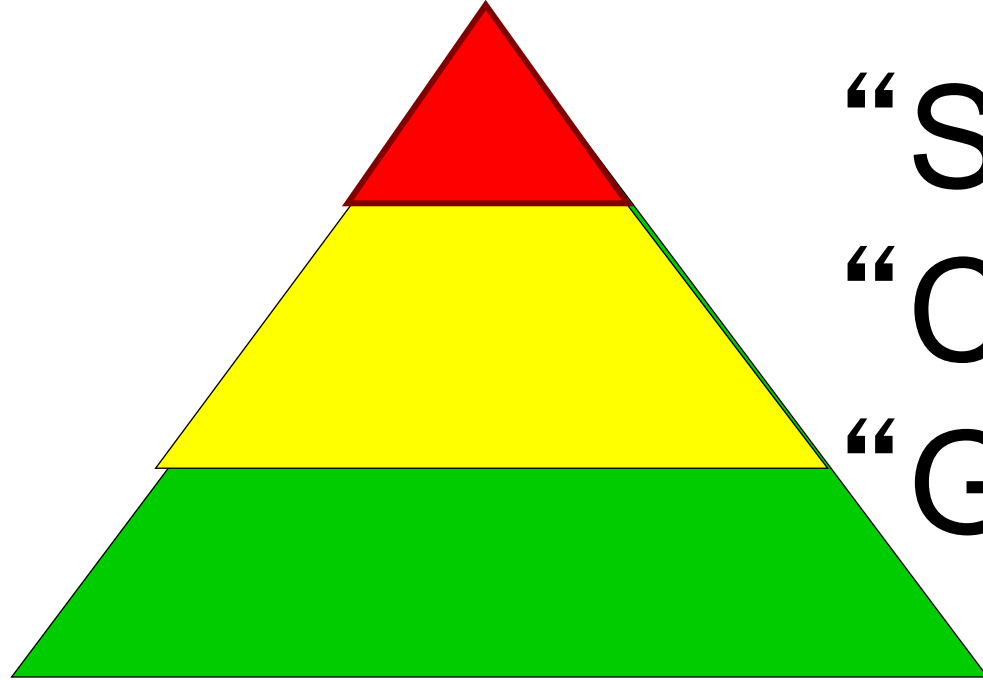
Based on Len Epstein's "Stoplight Diet"



“STOP”

“CAUTION”

“GO”



Proposed Revised PWS Food Pyramid

- **Red Foods provide little or no nutritional benefits; may add to food seeking/craving**
- **Orange Foods: nutritional benefits but also high calorie**
- **Yellow Foods: low fat protein sources**
- **Green Foods: High water content; very low calorie**

Color Code	Description	Recommendation	Examples
RED	Foods which provide no nutritional benefit and are detrimental	Eliminate Sugar, sweets, processed foods and starchy foods.	Cakes, cookies, chips, bread, pasta, corn, potatoes, rice
Orange	Foods which have high calorie content but are very nutritious	Use in small servings daily	Unsalted nuts, avocados, grass fed butter, coconut oil, olive oil, full fat dairy, berries and other fruit
Yellow	Nutritious foods that are low fat and moderate in calorie content	Usually provide protein source at every meal	Lean meat and eggs, low fat dairy,
Green	Nutritious foods which are naturally low in calories	May be used generously but not without limits.	Lettuce and other green leafy vegetables, broccoli, cabbage, spinach, brussel sprouts, kale

GREEN FOODS

High nutrient and low calorie



Yellow Foods

Lean Protein

Small amounts of Fat

Very small amounts of Carbohydrate

Meat Group

75 calories per serving

1 serving = 30 grams

Lean Meat and Fish

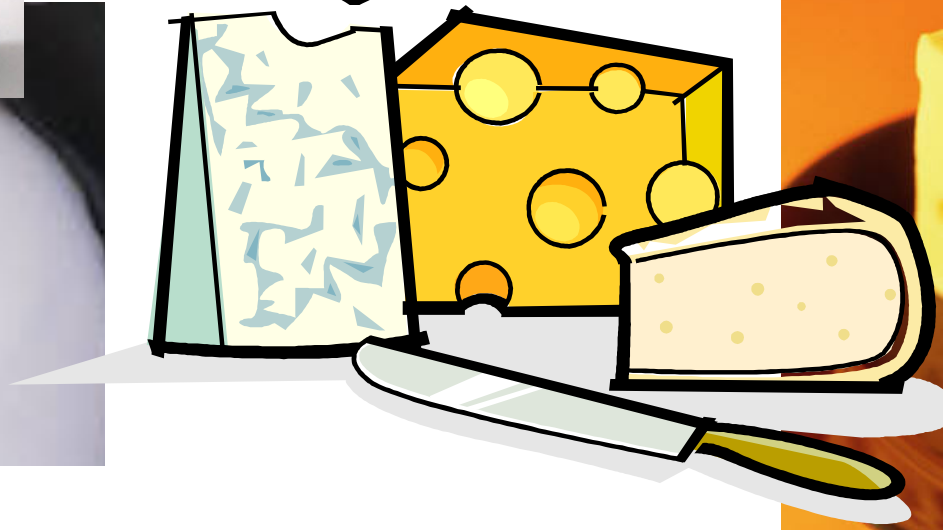
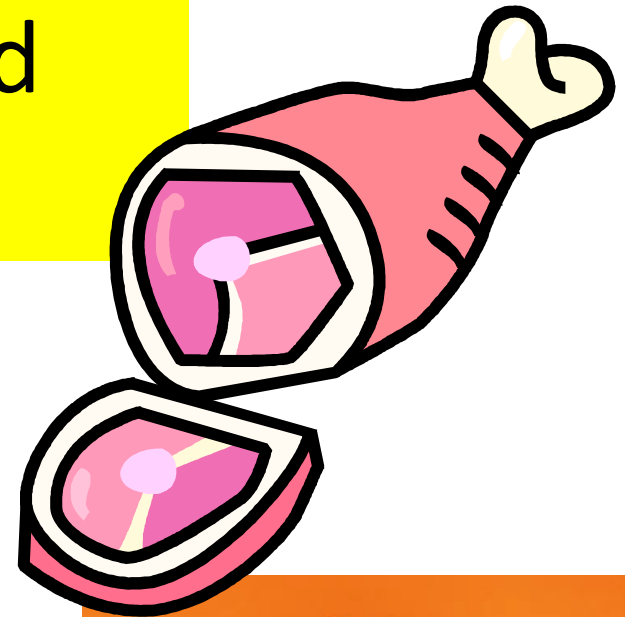
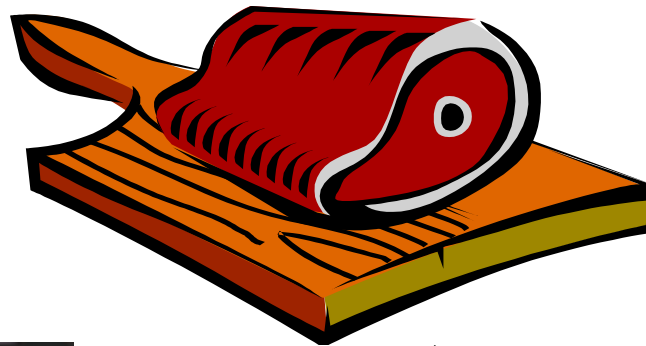
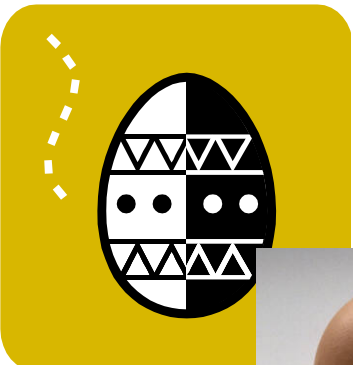


High nutrient and
medium calories



Cheese, Eggs, Cold Cut Meats

High nutrient and
medium calories



Orange Foods Fruits

Avoid sweet fruits: high reward

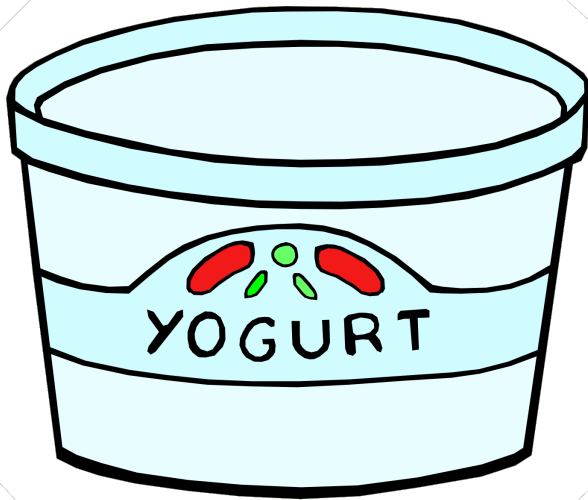


Choose High nutrient, low
sugar content and medium
calorie
Berries are Best

Orange Foods

Milk Group

Yogurt



Plain yogurt
recommended; all
flavored yogurts
have a high sugar
content

milk



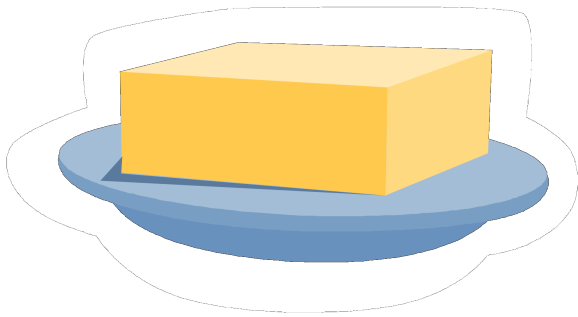
Cheese



High nutrient
high or medium
calorie

Fats and Oils Group

1 serving = 5 ml.



High nutrient and high calorie

Recommended Fats:

- Naturally saturated fats
 - Coconut oil and animal fat
- Monounsaturated Oils
 - Olive oil and Avocado Oil
 - High oleic sunflower oil
- Avoid soybean, canola and corn oils



Orange FOODS

1 serving= 15 ml.



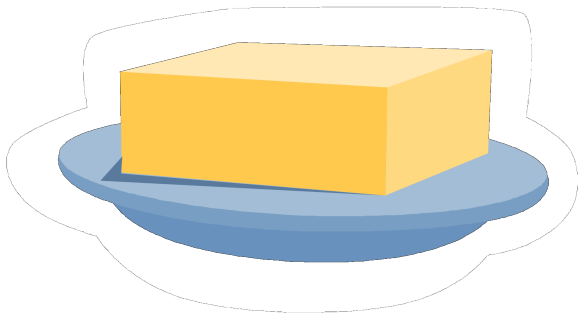
Recommend unsalted

High nutrient and high calorie



Fats and Oils Group

1 serving = 5 ml.



High nutrient and high calorie

Recommended Fats:

- Naturally saturated fats
 - Coconut oil and animal fat
- Monounsaturated Oils
 - Olive oil and Avocado Oil
 - High oleic sunflower oil
- Avoid soybean, canola and corn oils



Carbohydrate restriction:

Reward control

- Increasing body of research evidence that highly rewarding foods are problematic for a majority of humans
- Carbohydrate addiction is still controversial but gaining credibility among researchers
- Nonnutritive Sweeteners as well as sugar disrupt equilibrium both in neurobehavioral centers of brain and in metabolic regulation (insulin stimulation) and Microbiome



Carbohydrate Considerations

- PWS is prone to diabetes.
- There is evidence that diabetes is related to high carbohydrate intake in diabetes-prone persons: “carbohydrate intolerant”
- Anecdotally, ***nearly all PWS food-seeking behavior is directed toward obtaining carbohydrates and sweets.***

Proposed PWS Food Pyramid

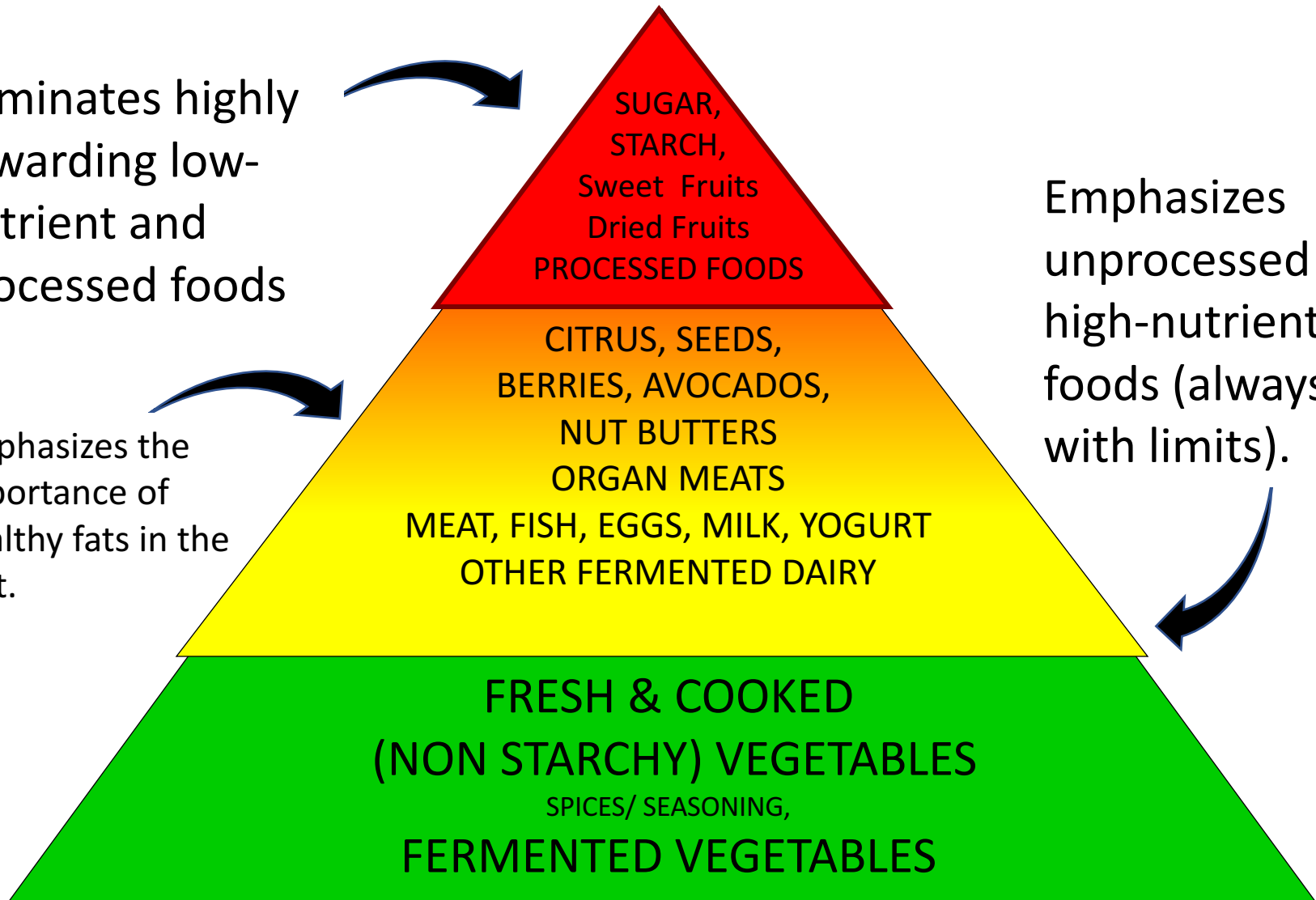
Eliminates highly
rewarding low-
nutrient and
processed foods



Emphasizes the
importance of
healthy fats in the
diet.



Emphasizes
unprocessed
high-nutrient
foods (always
with limits).



Traditional diets
of all cultures prior to
Food “Industry”
included:

- Raw foods
- Organ meats
- Fermented foods
- Bone broth