

## Enzymes and autism: Gut health, diet, and nutritional balance

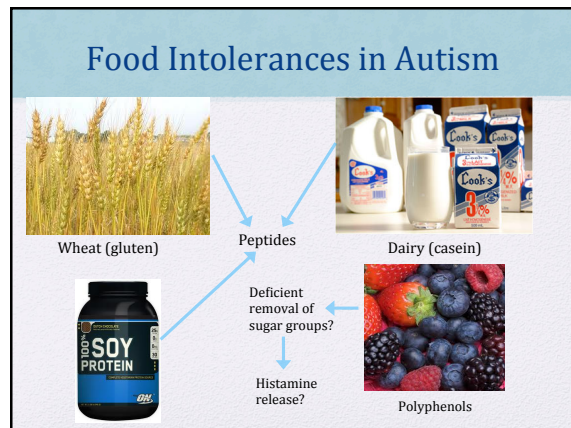
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## Autism and Digestion

- ❖ Decreased carb, starch digestion and transport
- ❖ Fewer short-chain fatty acids produced
- ❖ GI problems correlated with behavioral problems
- ❖ Inefficient breakdown of food proteins

## Causes of Food Intolerance

- Absence of enzyme needed to digest food
- Irritable bowel syndrome
- Food poisoning
- Sensitivity to food additives
- Recurring stress or psychological factors
- Celiac disease



## What Are Enzymes?

- Special proteins catalyze chemical reactions
- Unchanged during reaction
- Specific for single reaction
- Thousands of enzymes used in living systems
  - Metabolic – in cells, not replaced by oral supps
  - Digestive – Breakdown proteins, carbs, fats
    - Pancreatic (animal-based)
    - Plant-based (fruits, fungi, bacteria)

## Enzyme Supplements

- Complement restrictive diets.
- Enzymes can address foods missed by diets as well as increase diet effectiveness.
- Anecdotal improvements similar with enzymes and diet, indicating similar mechanism of action.

## Enzyme Supplements

- Can address enzyme deficiencies
- Shifts digestion from gut to stomach, a “safe” place to break down problem foods
- Very safe, no toxicity at any dose
- Provide benefits to anyone

## Multiple proteases necessary for complete protein breakdown

- Relying on single protease not sufficient
- Add other proteases with different peptide bond preferences to insure complete breakdown
- Studies of similar enzyme cocktails used in celiac trials, possible FDA approved treatment in future



## Carbohydrase enzymes for starches and carbs

- Studies indicate some children with autism may be low in disaccharidases
- Bacteria and yeast prefer to feed on undigested carbs in gut
- Cause of bloating, gas, loose stools when not broken down sufficiently
- Amylase, glucoamylase, lactase



## Enzymes for Polyphenolic Foods

- Highly colored fruits & veggies: good nutrition but not tolerated by some
- Raw veggies may be hard on GI tract
- Enzymes such as xylanase, cellulase, glucanase can help solubilize fiber
- Prevent “flushing” effect seen with certain foods and wines?

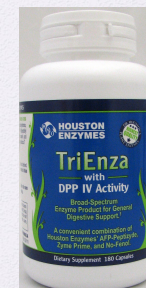


## Enzyme Dosing

- Experimentation encouraged, no toxicity, safe dosing
- Try taking enzymes at beginning of meal
- Base dosing on size of meal, not body weight or age
- May be taken with most medications or other supplements
- Effective with first dose for digestive results

## Choosing an enzyme product

- Try to match dietary problem to enzymes needed
- Take enzymes at beginning of meal if possible
- Base dosing on size of meal, not body weight or age
- May be taken with most medications or other supplements
- Effective with first dose for digestive results



## Avoid This Product!

### Supplement Facts

Serving Size: 3 Capsules  
 Servings Per Container: 40

<b>"Super-Duper" enzyme blend</b>	505mg
<b>Vegetal Analog of Pancreatin</b>	286 mg
<b>Acid Stable Protease</b>	12 mg
<b>Amylase</b>	52 mg
<b>Amyloglucosidase</b>	12 mg
<b>Cellulase</b>	5 mg
<b>Lactase</b>	5 mg
<b>Cellulase</b>	5 mg
<b>Hemicellulase</b>	3 mg
<b>Lipase</b>	125 mg

\*Daily Value not established

Values listed are based on serving size, be sure to check

Milligram units are useless for enzymes

Make sure "proprietary blends" are listed on label

## Better Product

### Supplement Facts

Serving Size: 1 Capsule  
 Servings Per Container: 120

<b>Peptidase</b>	50,000 HUT
<b>Xylanase</b>	16,000 XU
<b>Protease 800</b>	65,000 HUT
<b>Amylase</b>	12,000 DU
<b>Protease 6.0</b>	25,000 HUT
<b>Glucosylase</b>	25 AGU
<b>Lactase</b>	1,500 ALU
<b>Alpha-galactosidase</b>	200 GalU
<b>Beta-glucanase</b>	30 BGU
<b>Lipase</b>	200 FIP

\*Daily Value not established

Activity units guarantee active product

No "Proprietary Blend" hiding ingredients

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