

Digestion-gut-autism connection: the Specific Carbohydrate Diet

Elaine Gottschall, BA, MSc

Email: kirkton@eagle.ca

Website: www.breakingtheviciouscycle.info

Abstract

In many cases, children with neurological issues such as autism and seizure disorder are also experiencing symptoms of chronic constipation, periods of diarrhea, abdominal pain, and indications of intestinal bacterial and fungal overgrowth. More and more parents and clinicians are beginning to connect the function of the gut with the brain and are finding that correcting digestive imbalances by altering the diet can lead to significant overall improvement in the child's mental and physical health and in several cases reduce or even eliminate aberrant behavior and seizure activity. An alphabetized table of foods allowed on the Specific Carbohydrate Diet (SCD) are given in Appendix 1 of this manuscript. Several representative case histories are presented in Appendix 2.

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Keywords: autism, digestion, carbohydrate diet

Digestion is the great secret of life [1].
What the patient takes beyond his ability to digest does harm [2].

1. Introduction

1.1 A mother's view

From 1952 to 1960, there seemed to be no answers to the series of health problems facing our child: periods of severe diarrhea, severe constipation, spontaneous nosebleeds, night-time seizures, failure to thrive, and finally the diagnosis of ulcerative colitis. The years of treatment with prednisone and sulfonamides, plus innumerable other medical approaches, had been unsuccessful and surgery seemed imminent. The prospect of the removal of an eight-year-old child's colon can be described, as one Mother said when faced with the same prospect, "It was like every black cloud ever created was hovering over us." And then, it happened! An acquaintance pointed us to the office of Dr. Sidney Valentine Haas, a specialist practicing pediatrics in New York City. Ninety-two year old Dr. Haas placed our child on the Specific Carbohydrate Diet and within days, the neurological symptoms ceased, never to return, the colitis symptoms were completely resolved within one year. The child began to thrive leaving all the previous problems behind and making up for lost time.

How could a simple diet cure an "incurable disease?" The mystery haunted me and launched me on a "treasure hunt" through academia for the next 12 years.

1.2 A scientist's view

The pieces of the puzzle began falling into place during the process of integrating old and new findings in the science of digestion, immunology, nutritional biochemistry, microbiology, cellular biology, and histology. Even as this odyssey progressed, discoveries were rapidly being reported in the medical literature. It became apparent that in those suffering with intestinal problems there is injury to the intestinal surface, specifically, to the digestive enzymes residing on the intestinal cells. This prevents the completion of digestion of most carbohydrates

and some protein and, therefore, these undigested foods provide excess nutrition for the unseen world of intestinal microbes. Result: they overpopulate. Their increase in numbers causes an increase in fermentation. This produces the following events: (1) the production of an excess of short chain organic acids (thus lowering the pH of the colon); (2) an increase in the production of metabolic byproducts of fermentation as well as bacterial toxins; and (3) a possible mutation of some harmless bacteria into pathological forms.

Additionally, excess mucus production on the surface of the intestinal cells prevents further digestion and absorption of carbohydrates. The Specific Carbohydrate Diet developed by Dr. Sidney V. Haas provides an intervention to this vicious cycle by depriving intestinal microbes of their energy source while providing excellent nutrition to the patient. By providing a diet that contains predominantly "predigested" carbohydrates, the individual with an intestinal problem can be maximally nourished without over-stimulation of the intestinal microbial population.

Slides show biopsies taken from children, all with chronic diarrhea, (including soy-protein, milk protein, and gluten sensitivities). It can be seen that the intestinal mucosa has an increase in mucus covering in which colonies of microorganisms are found. There is increased cell shedding and turnover, damage to the intestinal microvilli, partial and complete villous atrophy, and resulting carbohydrate intolerance.

To summarize, the continual, indiscriminate feeding of undigestible, and, thereby, unabsorbable carbohydrates to individuals with chronic diarrhea (with various diagnoses) can only perpetuate and exacerbate the problems.

2. Human digestion and absorption *or* bacterial metabolism

The Specific Carbohydrate Diet entered the world of autism through "the back door" - the intestinal tract. And what may

have first appeared to be “the back door,” via the digestive system, is rapidly becoming one of the most scientifically researched areas in determining what may be one of the underlying causes of many autism spectrum disorders [3]. Because the Specific Carbohydrate Diet's goal is to heal the intestinal tract and to rid it of bacterial and fungal overgrowth, it is proving to be a very successful dietary intervention in treating many autistic children and leading them back to a life of normalcy. (See Appendix I)

Studies have revealed that eventually more than four hundred bacterial species live together in the human colon [4]. The stomach and most of the small intestine do not normally harbor more than a sparse population of microbial flora. However, the number of microbes normally increases at the lowest part of the small intestine, the ileum, because of its close proximity to the microbial-rich colon.

In the healthy intestinal tract, intestinal microbes appear to live in a state of balance; an overabundance of one type seems to be inhibited by the activities of other types. This competition between microbes prevents any one type from overwhelming the body with its waste products or toxins. Another important protective factor which works to maintain the sparse bacterial population of the stomach and upper small intestine is the high acidity of the stomach's hydrochloric acid in which microbes cannot usually survive. In addition, normal peristalsis (waves of involuntary muscular contractions) sweeps many microbes out of the intestine to be lost in the feces, thereby, decreasing their numbers [5].

However, bacterial overgrowth in the stomach and small intestine can and does increase in our children's intestines for various reasons among which are the following:

- a. Malnutrition or a diet of poor quality (high in refined sugars and processed and concentrated starch foods such as most cereals, potatoes, and bread/grain products [6, 7].
- b. Antibiotic therapy which can cause a wide range of microbial changes. A microbe commonly residing the intestine without harmful effects may undergo a wide range of changes as a result of antibiotic therapy [8].
- c. Injury to the intestinal surface (microvilli enzymes) preventing the complete digestion of most carbohydrates and some proteins leaving undigested carbohydrates in the small intestine [9–12]. Their presence in the lumen (interior space) of the intestine causes a reversal of the normal nutritional process. Instead of nutrients flowing from the intestinal space into the bloodstream to ultimately nourish the brain and other organs, water is drawn in to the intestinal lumen. The water, carrying nutrients and calories is lost in abnormal intestinal function (diarrhea), and the cells of the body are deprived of energy, minerals and vitamins. Most seriously, the sugars remaining in the intestinal lumen provide energy for further growth of intestinal microbes - most often overgrowth [13, 14]. The undigested, unabsorbed carbohydrates have the greatest influence on the growth of intestinal microbes [15]. When these microbes multiply as a result of this excess of energy which normally would go to the cells of the body, they produce waste products which have been shown to markedly affect the brain and behavior [16–21].

In 1985, Coleman and Blass in *The Journal of Developmental Disorders* reported the first evidence that autism might be linked to carbohydrate digestion [22]. These researchers reported that the syndrome of D-lactic acidosis (D-lactic acid is a byproduct of bacterial fermentation (the process by which microbes get energy from carbohydrates) was present in autistic children. Their work was based on reports of the 1970's and 1980's showing that undigested carbohydrates were being changed by bacterial action in the intestine to a substance known as D-lactic acid. High amounts of D-lactic acid in the bloodstream have been found to cause bizarre behavioral symptoms. Among these symptoms were aggressiveness, sudden disorientation, blurred vision, blunted judgment, abusive behavior, slurred speech, staggering gait, rolling of the eyeballs, confusion, and delirium. The attacks lasted from 36 to 60 hours. Using the most sophisticated methods of analysis, it was found that carbohydrates were not being digested or absorbed (in these cases, surgery had severely limited digestive capacity) and intestinal bacteria were, therefore, being flooded with a surplus of carbohydrates which were being fermented in the remaining intact intestinal tract. As a result, a waste product of bacterial fermentation, D-lactic acid, was being produced in abnormally large amounts. It is currently thought that this acid, along with other toxic products produced by intestinal microbes, is entering the brain and “poisoning” the brain cells. It has been noted that this same type of malabsorption and the resulting production of D-lactic acid occurs not only when there has been surgical shortening of the intestine but in other gastrointestinal disorders as well.

We are faced, then, with intestinal malfunctioning which involves microbial populations which have been altered in number, in kind, or both. The normal contractions (peristalsis) of the intestinal muscles are not able to remove them, they appear to be tenacious. Indeed, there is evidence that intestinal microbes will not cause disease unless they develop methods of adhering to the gut wall. Antibiotic therapy is of limited usefulness and has side effects if continued too long.

A sensible and harmless form of warfare on the aberrant population of intestinal microbes is to manipulate their energy (food) supply through diet. Most intestinal microbes require carbohydrates for energy [23] and the Specific Carbohydrate Diet severely limits the availability of carbohydrates. By depriving intestinal microbes of their energy source, their numbers gradually decrease along with the waste products and toxins they produce.

3. Leaky gut and bacterial overgrowth

In a healthy intestinal tract, the intestinal columnar cells form a barrier preventing contents of the gut lumen from entering the bloodstream until these contents (mainly undigested food) are thoroughly broken down by digestive enzymes. The columnar cells stand like “gatekeepers,” tightly joined by desmosomes, in a velcro-like fashion, preventing antigenic substances (such as incompletely digested proteins and bacterial toxins) from entering the underlying tissues of the intestinal mucosa, as well as the bloodstream, from passing through. However, it is believed that this tight barrier function is dis-

rupted by various agents among which are infectious agents such as bacteria, viruses, and protozoa [24].

It is thought by this author that if the bacterial overgrowth is corrected through diet, these leaky junctions will revert to normalcy thereby preventing the entrance of antigenic substances which trigger the adaptive immune system in abnormal ways.

It has also been suggested by recently published reports that bacterial toxins produced in the intestine can result in sensitivities to certain dietary protein [25, 26]. The researchers ask the question, “Can the body’s innate immune system, by reacting to the toxins of certain bacterial cell walls, cause the sensitivities to proteins such as casein and gluten?” The explanation for this interaction between bacterial overgrowth/toxins and the production of cytokines and antibodies, initiators of the inflammatory response is that there are two immune systems - the innate immune system and the adaptive immune system and that the innate immune system triggers the adaptive immune system.

4. Why Specific carbohydrates? Why lactose, sucrose, and starch residues, the disaccharidases, promote the vicious cycle?

Light microscopy, as well as enzyme assays (in vitro studies), do not always demonstrate mucosal damage in the small intestine - mucosal damage that prevents the digestion of disaccharides and their ability to be transported into the bloodstream rather than to remain in the gut to overnourish intestinal flora.

Research has shown that in children diagnosed with chronic nonspecific diarrhea, gluten-sensitive enteropathy, milk protein-sensitive enteropathy, soy protein-sensitive enteropathy, protracted diarrhea of infancy, Giardiasis, cystic fibrosis, and Crohn's disease there is marked damage to the mucosal surface of the small intestine bearing the disaccharidase enzymes [13]. This indicates that carbohydrate digestion cannot proceed normally in infants and children with these diagnosis and, very possibly, autism/digestive disturbances.

In spite of the fact that measurement of disaccharidase activities was normal in most mucosal specimens, oral tolerance tests with lactose and sucrose were always abnormal because of the decrease of mucosal digestive enzymes. Additionally, using the scanning electron microscope, it was apparent that there was colonization of the surface of the mucosa with a variety of microorganisms - often acknowledged in children with the contaminated small bowel seen in chronic non specific diarrhea.

5. Summary

The continual, indiscriminate feeding of indigestible, and, thereby, unabsorbable carbohydrates to individuals with chronic diarrhea can only perpetuate and exacerbate the digestion and immunological problems.

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Appendix I. List of Foods allowed on the SCD

The following table contains an alphabetized list of foods that are legal or allowed (“yes”) and foods that are illegal or not allowed (“no”) by the Specific Carbohydrate Diet™, as outlined in the book, *Breaking the Vicious Cycle* by Elaine Gottschall. The SCD™ is a progressive diet and the introduction of many of these foods should be delayed until healing has taken place.

Some general guidelines are no grains (i.e. rice, wheat, corn, oats, etc.), no processed foods, no starchy vegetables (i.e. potatoes, yams, etc.), no canned vegetables of any kind, no flour, no sugar, no sweeteners other than honey and saccharin, and no milk products except for homemade yogurt fermented for 24 hours, prepared according to the instructions in the book.

In the author’s 40 years experience, she has found that certain cases of ulcerative colitis (UC) are unresponsive. Some of these cases are among those who have undoubtedly become nicotine-dependent. It is a well known phenomenon: the probability of developing UC increases within the first year of giving up smoking. Often, using SCD and chewing Nicoret® or wearing nicotine patches allow the diet to work. But, on the whole, these cases are difficult.

Some thrive on the diet but relapse in a year or two. In some cases a bacterium, *Clostridium difficile*, has been the underlying cause. The drugs Flagyl® or Vancomycin® most often bring these cases under control and the individuals do well over long periods.

There are a very small percentage (approximately 2%) of young children who respond to the diet, saving them from surgery. But their condition goes back and forth from stable to unstable. Often enzyme supplementation can help these cases, but most often they must resort to regimens of prednisone periodically.

There are doctors throughout the world prescribing SCD for various conditions in addition to inflammatory bowel disease (IBD). These include heavy metal toxicity, schizophrenia (which was reversed in one case), and even lupus (which was reversed) and cases of epilepsy, although improvement may be relatively slower in these other applications.

Disclaimer: Information published in this manuscript and in this appendix is intended for information purposes only. It is not the intention of this information to diagnose, prescribe, or replace medical care. Your doctor or nutrition expert should be consulted before undertaking a radical change of diet.

Food	Yes/ No	Note
Agar-agar	No	
Agave syrup	No	
Algae	No	Algae (Spirulina) is not used because IBD involves the immune system and algae can aggravate an already disturbed immune system.
Allspice	Yes	As long as Allspice is used as a cooking spice, it is legal. Do not use the oil.
Almond butter	Yes	Almond butter with no sugar added is allowed.
Almond milk	Yes	May be tried after being on the diet for 6 months.
Almond oil	Yes	
Almonds	Yes	Nuts sold in mixtures are not allowed, as most are roasted with a starch coating. Nuts should only be used as nut flour, in recipes, until diarrhea has subsided.

Aloe Vera	No	It contains mucilaginous polysaccharides as well as increasing the release of tumor necrosis factor which is associated with IBD inflammation and increased immune stimulation.
Amaranth flour	No	
Apple Cider	Yes	It is brown and not clear as apple juice is. It should be just straight pressed apples. It is usually pasteurized in order to kill bacteria. Cider should be diluted with water before drinking.
Apple Juice	No	Apple juice usually has sugar added during processing. Apple cider is allowed.
Apples	Yes	
Apricots	Yes	
Arrowroot	No	It is a mucilaginous herb. Mucilaginous herbs are loaded with starch. This starch is food for the pathogens that the SCD™ is designed to starve out.
Artichokes (French)	Yes	They are the green artichokes that you steam, then dip the leaves in lemon butter and scrape off with your teeth. They have edible hearts and an inedible choke.
Artichokes (Jerusalem)	No	They are actually a tuber, and are not legal.
Ascorbic acid	Yes	Should be nothing but Vitamin C.
Asiago cheese	Yes	May be used occasionally.
Asparagus	Yes	Fresh or frozen is allowed. Canned vegetables are not allowed.
Aspartame	Yes	When symptom free, one aspartame sweetened soft drink per week is allowed.
Aspartic acid	Yes	
Astragalus	No	Contains polysaccharides which are illegal.
Avocados	Yes	
Avocado oil	Yes	Good for mayonaise and salad dressings but might not withstand heat very well
Bacon	Yes	Smoked bacon that has been fried very crisply is allowed once per week. There are sugar-free bacons available and if you are able to find a source of sugar-free bacon, you do not have to limit your consumption to once per week. Usually the low sodium varieties do not contain sugar but check the labels carefully.
Baker's yeast	No	Saccharomyces cerevisiae is baker's yeast and is illegal.
Baking powder	No	Has starch as an ingredient, (usually corn starch) and other illegals to make it rise better.
Baking soda	Yes	
Balsamic vinegar	No	It is not that balsamic vinegar is illegal, it is that most balsamic vinegar purchased from a store has sugar added to it.
Bananas	Yes	They must be ripe with black spots on the skin.
Bark tea	No	Bark tea (Pau d'Arco) contains steroidal saponins and is both an immune booster and a laxative.
Barley	No	
Bean flour	See Note	Do not use ready-made flours from beans or lentils as they probably were not soaked prior to grinding to bean flour.
Bean sprouts	No	
Bee Pollen	No	Pollen is irritating to a damaged gut. Clear, pure, pasteurized honey is okay. Cloudy honey (still containing the pollen) should be avoided.
Beef	Yes	Fresh and frozen are allowed as long as nothing has been added during processing; check the labels carefully.
Beer	No	
Beets	Yes	
Berries	Yes	Berries of all kinds are legal.
Bhindi	No	No okra (bhindi) or drumsticks—since they are a mucilaginous food, they are illegal.
Bitter Gourd	No	
Black beans	Yes	May be tried when symptom free . Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Black eye beans	No	

Black radish	Yes	It is very fibrous, so go slowly and be careful.
Blue cheese	Yes	May be used occasionally.
Bok Choy	Yes	Bok Choy is much like cabbage and is legal but you should not use a member of the cabbage family until you are well on your way to getting better. In other words, do not use if you still have diarrhea and gas.
Bologna	No	
Bouillon cubes	No	Bouillon cubes and instant soup bases are not permitted.
Bourbon	Yes	Only have it occasionally.
Brandy	No	
Brazil nuts	Yes	Nuts sold in mixtures are not allowed, as most are roasted with a starch coating.
Brick cheese	Yes	May be used freely.
Brie cheese	Yes	May be used occasionally.
Broccoli	Yes	
Brussell sprouts	Yes	
Buckwheat	No	
Bulgur	No	
Burdock root	No	It contains inulin (FOS) and mucilage.
Butter	Yes	
Butter beans	No	
Buttermilk	No	
Cabbage	Yes	You should not use a member of the cabbage family until you are well on your way to getting better. In other words, do not use if you still have diarrhea and gas.
Camembert cheese	Yes	May be used occasionally.
Canellini beans	No	
Canned fish	Yes	Canned in oil or water is acceptable but check the labels carefully. Do not buy products containing "broth." Usually, the low sodium varieties do not contain "broth."
Canned fruits	note	Fruits canned in their own juice are allowed.
Canned vegetables	No	There are no canned vegetables permitted, they must either be fresh or frozen.
Canola oil	Yes	Legal, but not recommended.
Cantaloupe	Yes	
Capers	Yes	
Carob	No	
Carrageenan	No	Carrageenan is seaweed and high in polysaccharides, therefore illegal.
Carrots	Yes	
Cashews	Yes	Nuts sold in mixtures are not allowed, as most are roasted with a starch coating.
Cauliflower	Yes	Cauliflower is sometimes hard to digest and should be tried cautiously after some progress has been made on the diet.
Celeriac /celery root	Yes	However, you should go slow and be careful. It is very fibrous, even if it doesn't seem so when you steam it and mash it.
Celery	Yes	
Cellulose (in supplements)	Yes	Cellulose in your supplements is okay and virtually impossible to avoid.
Cellulose Gum	No	
Cereals	No	
Cheddar cheese	Yes	May be used freely.
Cheese	See Note	If a cheese is not a processed cheese (manufactured) but is a cheese that has had a bacterial culture involved with its production and is aged at least 30 days, then it is legal.
Cherimoya	Yes	Also known as custard apple or sharifa.
Cherries	Yes	
Chestnut flour	No	
Chestnuts	Yes	May be tried when symptom free. However, if you buy dried chestnuts, soak them and cook them until soft.
Chevre	No	
Chewing gum	No	Contains things like aspartame, maple or date sugar and other sugar substitutes which are illegal.

Chickory root	No	Contains large amounts of fructooligosaccharides.
Chick peas	No	
Chlorella	No	It is a blue-green algae similar to spirulina
Chocolate	No	
Cinnamon	Yes	
Citric Acid	Yes	Citric acid as an additive is legal.
Club soda	Yes	
Cocoa powder	No	
Coconut	Yes	Fresh or unsweetened, shredded coconut and coconut flour are all legal.
Coconut milk	Yes	May be tried after being on the diet for 6 months.
Coconut oil	Yes	Withstands heat well, good for frying/cooking.
Coffee	Yes	Coffee should be made very weak. Instant coffee is not allowed.
Coffee (instant)	No	
Collard greens	Yes	Of the cabbage family, introduce late in the diet.
Colby cheese	Yes	May be used freely.
Cordials	No	
Corn	No	
Corn oil	Yes	
Corn syrup	No	
Cornstarch	No	
Courgette	Yes	Also known as zucchini
Cranberry juice	Yes	We use Knudsen's Just Cranberry juice, as it has been checked out and does not have sugar added. It can be found in most health food stores. Juice should be diluted with water before drinking. Since this is pure cranberry juice it is very tart, you may sweeten it with saccharine or honey or dilute it with legal apple cider instead of water.
Cream	No	It is illegal as it contains lactose. Cream can be added to milk and then fermented to make SCD 24-hour yoghurt as the lactose will be used up in the fermentation. Cream has less lactose than milk and the more fat it contains the less lactose it has.
Cottage cheese	No	
Cream of Tartar	No	
Cream cheese	No	
Croscmellose sodium	No	
Cucumbers	Yes	
Custard apple	Yes	Also known as sharifa or cherimoya
Cyclamate	Yes	It is actually a better alternative than saccharine, if you can get it, because it has no aftertaste. But it's almost impossible to find by itself, and certainly not available in NA.
Date sugar	No	May be tried after being on the diet for quite some time and symptom free but it is not recommended.
Dates	Yes	Medjool and California dates are allowed. They must be loose and not have anything added.
Decaffeinated Products	No	Decaffeinated products are not legal since the manufacturing process may introduce questionable ingredients or reactions..
Dextrose (contained in commercial products)	No	The problem with the dextrose and fructose which is being sold as a granulated form as well as the dextrose contained in commercial products is that it is not pure dextrose which should be the same as the single sugar glucose found in fruits and honey.
Dried milk solids	No	
Drumsticks	No	No okra (bhindi) or drumsticks. Since they are a mucilaginous food, they are illegal.
Dry Curd Cottage Cheese	Yes	
Durum Flour	No	Its a type wheat grain flour
Echinacea	Yes	Especially if it is in Alcohol, but even it is in pill form with a bit of lactose. It can be very helpful if a cold or flu is coming on.
Edam cheese	Yes	May be used occasionally.
Eggplant	Yes	
Eggs	Yes	

EMPower	No	Has many Illegal ingredients, Brown Rice Bran, FOS, Bifidus, flax seed
Ethanol	Yes	Ethanol is alcohol—the kind in gin, etc.
Evaporated cane juice	No	Fancy name for sugar
Ezekiel Bread	No	Sprouted grain breads are illegal.
Faba beans	No	
Fenugreek	No	
Feta Cheese	No	Feta may be used after about 6 months of improvement. But used only in small amounts.
Filberts (hazelnuts)	Yes	Nuts sold in mixtures are not allowed since most are roasted with a starch coating. Only use as nut flour, in recipes, until diarrhea has subsided.
Fish	Yes	Fresh and frozen are allowed as long as nothing has been added during processing; check the labels carefully.
Flaxseed	No	Flax seeds contain lignin. Grinding lignin and tough stuff does not prevent certain microorganisms that respond by eating faster and making more toxins.
Flaxseed oil	No	Flax seed oil is extremely unstable and goes rancid (oxidizes) very easily, even when refrigerated.
Flour	No	
FOS	No	Also known as fructooligosaccharides.
Frozen Orange Juice	No	
Fructose (granulated)	No	Granulated fructose (or even liquid) that is sold as "fructose" has a mixture of other trisaccharides, etc. in it. It is extracted from corn and they are not too fussy about eliminating a few molecules of whatever that may get in with it.
Fruits (canned)	Yes	Fruits canned in their own juice are allowed.
Garbanzo beans	No	
Garfava flour	No	Made from two types of beans, Garbanzo beans and Fava beans, neither are SCD legal.
Garlic	Yes	Use fresh garlic; garlic powders have starch added as anti-caking agents. You may also make your own garlic powder from fresh garlic by dehydrating it and grinding it yourself.
Guar Gum	No	
Gelatin (unflavored)	Yes	It is a denatured protein that has lost its tertiary structure although it is not the best protein.
Ghee	Yes	It's clarified butter
Gin	Yes	Only have it occasionally.
Gjetost cheese	No	
Glucose candy	No	Contains granulated glucose is known to contains other sugars in addition to glucose.
Glycerin	Yes	Since glycerin is not a sugar to begin with, the "ol" at the end does not make it a sugar alcohol. Glycerin is considered to belong to the fat family. So does glycerol.
Glycerol	Yes	Since glycerin is not a sugar to begin with, the "ol" at the end does not make it a sugar alcohol. Glycerin is considered to belong to the fat family. So does glycerol.
Goatein	No	It is a Protein powders that contains Bifidobacteria Bifidum. Protein Powders are a bad idea in any case as they're generally oxidized cholesterol—damaged by heat.
Gorgonzola cheese	Yes	May be used occasionally.
Gouda cheese	Yes	May be used occasionally.
Granulated glucose	No	It is known to contains other sugars in addition to glucose.
Grape juice	Yes	White or dark grape juice is allowed. We use Welch's bottled grape juice, as it has been checked out and does not have sugar added. Avoid frozen grape juice, it usually has sugar added. Juice should be diluted with water before drinking.
Grapefruit	Yes	
Grapefruit juice	See Note	Only legal if fresh. Frozen, or canned grapefruit juice is not allowed. Juice should be diluted with water before drinking.

Grapes	Yes	
Grapeseed oil	Yes	
Green tea	Yes	Limited to 2 cups per day.
Gruyere cheese	Yes	
Gums	No	All gums are illegal.
Ham	Yes	Only if cured with salt, it is illegal if cured with sugar dextrose, etc.
Haricot beans	Yes	These are legal and are the same as navy beans. Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Havarti cheese	Yes	May be used freely.
Hazelnuts (filberts)	Yes	Nuts sold in mixtures are not allowed, as most are roasted with a starch coating. Nuts should only be used as nut flour, in recipes, until diarrhea has subsided.
HN-Zyme	No	Contains ricebran.
Homemade yogurt	Yes	See instructions on how to make legal yogurt.
Honey	Yes	
Horseradish sauce	Yes	If homemade, if manufactured only if you know they have not added illegals
Hot dogs	No	
Hydrolyzed Protein	No	This is another term for MSG. Regardless of whether it is SCD™ legal or not, we should all try to avoid it. MSG can be a potent neurotoxin.
Ice cream	No	Commercially prepared ice cream is not allowed. However, there are many wonderful recipes for homemade ice cream.
Inositol	No	Inositol is a sugar alcohol. Sugar alcohols will feed bacteria and that is something we do not want to do. Sugar alcohols generally cause diarrhea but small amounts in supplements are ok.
Inulin	No	Inulin is a FOS and is illegal.
Iron supplements	No	Please do not get vitamins with iron; they encourage all kinds of infections especially in the gut, and iron has had much research done on it re other diseases. No oral iron if you can help it. Just eat the liver pate and if you like liver, eat it at least once a week.
Jaggery (gur)	No	
Jalapenos	Yes	
Jicama	No	
Juice from concentrate	No	Juice from concentrate is normally illegal because when it is reconstituted they often add other things (like sugar). Often additives are not listed on the label
Kale	Yes	
Ketchup	No	Commercially prepared ketchup contains sugar and is not allowed. See the gourmet section of the book, <i>Breaking the Vicious Cycle</i> for a ketchup recipe.
Kidney beans	Yes	May be tried when symptom free. Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Kimchi	Yes	
Kiwi fruit	Yes	
Kohlrabi	No	
Kudzu (or kuzu)	No	It is a mucilaginous herb. Mucilaginous herbs are loaded with starch. This starch is food for the pathogens that the SCD™ is designed to starve out.
Kumquats	Yes	
KyoGreen powder	No	
L-Theanine	Yes	It is an amino acid, as long as its pure without illegal binders, etc its legal, as with any new food go slow introducing it.
leucine	Yes	A supplement ingredient.
Lactaid Milk	No	The rate of flow of galactose to the liver when one drinks lactose hydrolyzed milk is high. With lactose hydrolyzed milk, one ingests the two sugars, glucose and galactose, at the same time. Note: Lactaid Milk is Lactose Hydrolyzed Milk

Lactose Hydrolyzed Milk	No	The rate of flow of galactose to the liver when one drinks lactose hydrolyzed milk is high. With lactose hydrolyzed milk, one ingests the two sugars, glucose and galactose, at the same time. Note: Lactaid Milk is Lactose Hydrolyzed Milk
Lamb	Yes	Fresh and frozen are allowed as long as nothing has been added during processing; check the labels carefully.
Leek	Yes	
Lecithin	Yes	Derived from soy (illegal). There is plenty of lecithin in egg yolks and there is no particular need to take it outside of a whole food.
Lemons	Yes	
Lentils	Yes	Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Lettuce	Yes	All varieties of lettuce are legal.
Licorice	No	Licorice is both a demulcent and a laxative.
Lignin	No	Grinding lignin and tough stuff does not prevent certain microorganisms from responding by eating faster and making more toxins.
Lima beans	Yes	Dried or fresh are permitted. Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Limburger Cheese	Yes	May be used occasionally.
Limes	Yes	
Liqueurs	No	
Liquid Chlorophyll	No	
Macadamia nuts	Yes	
Macadamia oil	Yes	Makes the best tasting mayo, withstands heat well.
Magnesium citrate	Yes	(As a supplement ingredient)
Magnesium Stearate	Yes	(As a supplement ingredient)
Maltitol	No	Sorbitol, mannitol, and xylitol are all sugar alcohols and are not SCD™ legal. They fall under the category of indigestible carbs and sugars, and so allow companies to label things ‘sugar free,’ even though they are providing nutrition to the bacteria that live in your digestive tract.
Maltodextrin	No	Maltodextrin is the worst of the small molecules of sugars. It is a very short chain of glucose molecules (derived from starch). The chances of digestion are practically nil. It therefore will feed bacteria and because of its particular structure, it is likely worse than lactose.
Manchego cheese	Yes	
Mangoes	Yes	
Mannitol	No	Sorbitol, mannitol, and xylitol are all sugar alcohols and are not SCD™ legal. They fall under the category of indigestible carbs and sugars, and so allow companies to label things ‘sugar free,’ even though they are providing nutrition to the bacteria that live in your digestive tract.
Maple syrup	No	Maple syrup is a disaccharide.
Margarine	No	
Marshmallow	No	This is a mucilaginous herb that is loaded with starch. This starch is food for the pathogens that the SCD™ is designed to starve out.
Mastic gum	No	
Mead	Yes	If homemade and ingredients are honey and yeast, commercial is likely to have sugar added and is illegal
Meats	Yes	All fesh or frozen meats with no additives or processing are legal including beef, lamb, pork, liver, kidney, oxtail and tongue
Meats (canned)	No	
Meats (processed)	No	Most have additives such as starch, lactose and sugar e.g. hot dogs, turkey loaf, spiced ham, bologna, smoked meats.

Melatonin	No	
Melons	Yes	
Milk	No	Fluid milk of any kind is not permitted.
Millet	No	
Miso	No	
Molasses	No	
Molo-cure	No	The main constituent of Molo-cure is aloe. Aloe is not SCD™ compliant as it contains mucilaginous polysaccharides as well as increasing the release of tumor necrosis factor which is associated with IBD inflammation and increased immune stimulation.
Monterey Jack cheese	Yes	May be used occasionally.
Mozzarella cheese	No	
MSG	No	Regardless of whether it is SCD™ legal or not, MSG should be avoided as it can be a potent neurotoxin.
Mucilaginous Herbs	No	Slimy, mucilaginous substances are often prescribed by those who think the “coating” properties are helpful to the intestines. They aren’t. Those with compromised guts cannot digest this.
Mucilaginous Polysaccharides	No	Slimy, mucilaginous substances are often prescribed by those who think the “coating” properties are helpful to the intestines. They are not. Those with compromised guts cannot digest this.
Muenster cheese	Yes	May be used occasionally.
Mungbeans	No	
Mushrooms	Yes	
Mustard (plain)	Yes	Mustard is legal as long as it doesn’t contain illegal ingredients; read the labels carefully.
Natural Flavors	No	“Natural flavoring” can be used to refer to anything, including the chemicals coming from big “flavor” companies which sell chemicals to food processors.
Natural cheeses	Yes	
Navy beans	Yes	Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Nectarines	Yes	
Nettles	No	Adverse effects from consuming nettle tea can range from upset stomach to burning sensations in the skin, difficulty in urination and bloating.
Neufchatel cheese	No	
Noni Juice	No	
Nutmeg	Yes	
Oats	No	
Okra	No	No okra (bhindi) or drumsticks, since they are a mucilaginous food, they are illegal.
Olive oil	Yes	Olive oil withstands heat well, good for frying cooking and is highly recommended.
Olives	Yes	Olives are legal as long as they do not contain illegal ingredients; read the labels carefully.
Onions	Yes	Use fresh onions. Onion powders have starch added as anti-caking agents. You may also make your own onion powder from fresh onions by dehydrating them and grinding them yourself.
Orange juice	Yes	Fresh orange juice that does not have sugar added is allowed. While diarrhea is active, avoid having orange juice in the morning. We use Tropicana’s Original Orange Juice, as it has been checked out and does not have sugar added.
Oranges	Yes	
Pappadum	No	They are an Indian snack made from lentils—they’re like a chip. Also contains rice flour.
Papayas	Yes	
Parmesan cheese	Yes	May be used occasionally.
Parsley	Yes	
Parsnips	No	Some children do well with them; others do not. However, they are good from a carb standpoint.
Pasta	No	

Pau 'Arco	No	Bark tea (Pau d'Arco) contains steroidal saponins and is both an immune booster and a laxative.
Pea flour	No	
Peaches	Yes	
Peanut butter	Yes	Natural peanut butter with no sugar added is allowed. The use of this item is controversial however due to its structure.
Peanuts	Yes	Peanuts in the shell may be tried cautiously after 6 months on the diet if diarrhea is gone. Shelled peanuts are illegal. Nuts sold in mixtures are not allowed, as most are roasted with a starch coating.
Pears	Yes	
Peas	Yes	
Pecans	Yes	Nuts sold in mixtures are not allowed, as most are roasted with a starch coating. Nuts should only be used as nut flour, in recipes, until diarrhea has subsided.
Pectin	No	It is a polysaccharide which, in the presence of acid and sugar, gels. It is used as a thickener in jams, and occurs naturally in some fruit, like apples. In apples, it's mostly in the peel, and for someone beginning the diet, you normally wouldn't get too much from eating an apple, because you'd peel it. Pectin as an added ingredient is not legal, as it is a complex sugar.
Peppermint tea	Yes	Some brands out there put in natural flavourings which would make them illegal, so check the ingredients carefully.
Peppers	Yes	Green, yellow, and red peppers are permitted. Also jalapeno peppers, habanera peppers, chili peppers, poblano peppers, relleno peppers, etc. are legal.
Peptizyde	No	Contains ricebran.
Persimmons	Yes	
Pickles (dill)	Yes	Dill pickles are legal as long as they do not contain illegal ingredients; read the labels carefully.
Pine nuts	Yes	They are very hard to digest and even grinding them for pesto does not make them any easier on your gut. May be tried in small amounts after symptoms have subsided.
Pineapple	Yes	
Pineapple juice	Yes	Fresh pineapple juice that does not have sugar added is allowed. We use Dole's unsweetened pineapple juice in the can, as it has been checked out and does not have sugar added. Juice should be diluted with water before drinking.
Pinto beans	No	Even after soaking they have the wrong kind of starch
Pistachio nuts	Yes	They are legal, but the skins can be really tough for newbies. And don't get the pink dyed ones, or the salted ones because they can have starch added to them. You can get unsalted, unroasted pistachios at the health food store and then roast them yourself.
Phosphatidylcholine	Yes	This is another name for lecithin which is legal. Eggs have a huge amount of this, but if you do not eat eggs, perhaps a bit of supplement is fine.
Plantains	No	They contain too much starch.
Polysorbate 80	No	
Pomegranate concentrate	No	
Pork	Yes	Fresh and frozen are allowed as long as nothing has been added during processing; check the labels carefully.
Pork Rinds	Yes	Use the plain pork rinds with no added flavourings and check the label carefully to make sure they don't contain illegal ingredients
Port wine	No	Its full of sugar
Port du Salut cheese	Yes	May be used occasionally.
Postum	No	
Potassium Sorbate	Yes	(supplement ingredient)
Potatoes	No	Both white and sweet potatoes are illegal.

Poultry	Yes	Fresh and frozen are allowed as long as nothing has been added during processing; check the labels carefully.
Primal Defense	No	
Primost cheese	No	
Processed cheeses	No	See the appendix of the book, <i>Breaking the Vicious Cycle</i> , for a complete list of illegal cheeses.
Protein power	No	
Provolone cheese	Yes	Although not listed with the other cheeses on page 140 of <i>Breaking the Vicious Cycle</i> , provolone cheese is legal.
Prunes	Yes	
Psyllium husks	No	They are loaded with cellulose and lignin which some bacteria thrive on. We accept that the cellulose in vegetables and fruit can be handled OK but a concentrated form such as husks would not be in order.
Pumpkin	Yes	Fresh pumpkin is legal, canned pumpkin is not allowed. Butternut squash may be used as a substitute for pumpkin in baking.
Pumpkin (canned)	No	Canned pumpkin is illegal. Butternut squash may be substituted for pumpkin in baking.
Quinoa	No	Since Quinoa is 60% starch, it is very illegal.
Raisins	Yes	Try them cautiously.
Rhubarb	Yes	
Rice	No	Both brown and white rice are illegal.
Rice Bran	No	Except as a supplement filler—as it is mainly oil. If one is taking a supplement which has proven to be efficacious, then the small amount of filler within the supplement will probably not have an adverse effect.
Rice Flour	No	
Ricotta cheese	No	
Romano cheese	Yes	May be used occasionally.
Roquefort cheese	Yes	May be used occasionally.
Rutabaga	Yes	Also known as swede It is very fibrous, so go slow and be careful.
Rye	No	
Saccharine	Yes	
Safflower oil	Yes	
Sago starch	No	
Sake	No	It is not a distilled spirit like Vodka and it is the distillation that removes the illegals. Both sweet and dry sake still have sugar and actually the dry sake has more sugar than the sweet sake but you can't taste it because of the acidity.
Salt	Yes	Ordinary iodized table salt, altho it sometimes has dextrose, is legal because it is important to get that iodine
Sashimi	Yes	(Japanese sushi-style raw fish served all by itself w/o rice)
sauerkraut	Yes	Only for advanced SCD'ers
Scotch whisky	Yes	Only have it occasionally.
Seaweed	No	Seaweed is high in polysaccharides and therefore illegal.
Seed Flour	No	It is not allowed because the quantity of the flour way surpasses the few seeds that are permissible after 3 months of no symptoms.
Seeds	Yes	Permissible after 3 months of no symptoms.
Sesame oil	Yes	
Sharifa	Yes	Also known as custard apple or cherimoya
Shellfish	Yes	Fresh and frozen are allowed as long as nothing has been added during processing; check the labels carefully.
Sherry	No	
Silica	Yes	(supplement ingredient)
Silicon Dioxide	Yes	(supplement ingredient)
Slippery elm	No	It is a mucilaginous herb. Mucilaginous herbs are loaded with starch. This starch is food for the pathogens that the SCD™ is designed to starve out.

Smoked meats	No	Unless you are certain that no sugar has been added during the smoking process, they are not permitted.
Sodium Benzoate	Yes	A supplement ingredient.
Sodium starch glycinate	No	
Sorbitol	No	Sorbitol, mannitol, and xylitol are all sugar alcohols and are not SCD™ legal. They fall under the category of indigestible carbs and sugars, and so allow companies to label things 'sugar free', even though they are providing nutrition to the bacteria that live in your digestive tract.
Sour cream	No	
Soy	No	
Soy Lecithin	Yes	Soy lecithin is an extract of one of the fats in soy and is allowable.
Soy Sauce	No	Soy sauce is a fermented soy product but contains wheat so it is illegal.
Soybean milk	No	
Soybean oil	Yes	
Soybeans	No	
Spearmint Tea	Yes	
Spelt	No	
Spices	Yes	Spices of all kinds may be used, but avoid spice mixtures; buy spices separately.
Spinach	Yes	
Spirulina	No	We do not use algae (Spirulina) because IBD involves the immune system and can aggravate an already disturbed immune system.
Splenda	No	
Split peas	Yes	Dried legumes must be prepared according to the instructions in the book, <i>Breaking the Vicious Cycle</i> .
Sprouted Grain Bread	No	
Squash	Yes	Both winter and summer squashes are legal.
Stevia	No	Its molecular structure resembles a steroid and the effects are unknown.
Stilton cheese	Yes	May be used occasionally.
String beans	Yes	Also called "Green Beans."
Sucralose	No	
Sulphates	Yes	When a fruit such as peaches (dried) and coconut is sulphated, it means it has been exposed to sulphur to keep the color from darkening. Some people are allergic to sulphated products but most are not bothered by them.
Sunflower oil	Yes	
Sweet Potatoes	No	
Swede	Yes	This is another name for rutabaga.
Swiss cheese	Yes	May be used freely.
Tabasco	See note	Only the original Red Tabasco is legal but as with all manufactured products check the ingredients. The other Tabasco styles all have sugars and gums added.
Tagatose	No	
Tamari	No	
Tamarind	No	
Tangerines	Yes	
Tapioca	No	It is a starch, therefore illegal.
Tapioca Flour	No	
Taro	No	It has much too much starch in it and is very similar to potatoes.
Tea	Yes	Ordinary black tea is legal but should be made weak. Instant tea, Ojibwa tea (Essiac), many herbal teas, teas made from bark etc are full of polysaccharides and are illegal. Peppermint and spearmint herb teas are legal, and you can make a tea from ginger which is also legal.
Tofutti cheese	No	

Tofu	No	It is made from soy
Tomato juice (canned)	Yes	Should only have salt added.
Tomato paste (canned)	No	
Tomato purée (canned)	No	
Tomato sauce (canned)	No	
Tomatoes	Yes	Canned tomatoes are illegal.
Triticale	No	
Turbinado	No	It is liquid cane sugar, therefore it is illegal.
Turnips	No	Recently, turnips were moved from the 'allowed' list to the 'not allowed' list.
Vanillin	Yes	But not in concentrated form.
V8 Juice	No	It has tomato paste listed as an ingredient which is illegal. It is also made from concentrate and has added sugar.
Vegetables (canned)	No	Canned vegetables are not permitted; they must either be fresh or frozen.
Vegetable stearate	Yes	Stearate is always a fat (stearic acid) so vegetable stearate would likely be a fat from some vegetable like coconut, etc.
Vinegar	Yes	Red and white wine vinegar also white and cider vinegars are allowed but check the label for added illegals. Balsamic vinegar is not allowed as it has added sugar.
Vitamin E from soy	Yes	
Vodka	Yes	Only have it occasionally.
Walnuts	Yes	Nuts sold in mixtures are not allowed, as most are roasted with a starch coating. Nuts should only be used as nut flour, in recipes, until diarrhea has subsided.
Walnut oil	Yes	This oil does not withstand heat very well.
wasabi	No	
Water chestnuts	No	
Watercress	Yes	
Watermelon	Yes	
Wheat	No	
Wheat germ	No	
Wine	Yes	Very dry wine is legal.
Xanthum Gum	No	
Xylitol	No	Sorbitol, mannitol, and xylitol are all sugar alcohols and are not SCD™ legal. They fall under the category of indigestible carbs and sugars, and so allow companies to label things 'sugar free,' even though they are providing nutrition to the bacteria that live in your digestive tract.
Yams	No	
Yoghurt (commercial)	No	Eating commercial yoghurt is not permitted. Commercial yoghurt may be used as a starter for making homemade yogurt.
Yoghurt (homemade)	Yes	You sterilize the milk by heating it to a simmer, this kills all the existing bacteria in the milk so that it will only be fermented by the starter bacteria culture which we add when the milk has cooled enough. Keep it warm for 24-hours, the starter culture multiplies and consumes the milk to produce yoghurt.
Yucca Root	No	
Zucchini	Yes	Also known as Courgette

Appendix 2. Case Histories concerning use of SCD

Roger Jackson, MD concerning his wife's recovery from ulcerative Colitis

October 1, 2003

CeCelia has Ulcerative Colitis of 10 years duration that has progressed from distal proctitis to near universal colitis on her last yearly colonoscopy. She was having flare ups several times yearly controlled with Prednisone. She usually was on Mesalamine or Azulfidine. Of course she had the usual cramps and urgency and chronic bleeding (for years) and iron deficiency. In Spring 2003 she had a flare despite just ending a six-week Prednisone taper.

She tried Molocure for two months but stated that it was ineffective and stopped it. She then found the low (grain) carbohydrate diet with homemade yogurt and fruit. She has religiously stuck to the diet after reading the book. Although the diet has been tough she has had a rather remarkable and sustained response for six months. No bleeding, slight urgency only and solid stools-- she takes Citrucel for the spastic colon now. She will have another colonoscopy in the next few months and it should be much less inflamed.

As of February 3, 2004 she had her follow up colonoscopy after ten months of the SCD diet. The colonoscopy was entirely normal! The gastroenterologist was visibly surprised. He suggested a repeat colonoscopy in five years.

Sarah Branham concerning the recovery her son has made after being on SCD for 3 weeks

Yesterday, I sat down and did another ATEC score on Chris. I thought to do this because my son said, "What is that? and What's it do?" Not only is he picking up words (he now has about 25-30 words) but he is using a couple full sentences. To look at him, you would hardly be able to believe it's the same child. The ATEC score was 58. His baseline score was 125 on January 26th, followed by a score of 69 about a week ago. In mathematical thinking, that is a 67 point drop, which takes him out of severe range and into mild range ... In the thinking of being his mother? I have gotten my child back.

Yes, this diet has only been implemented for 3 weeks and it's rough. No colorings, additives, sugars, starches, preservatives ... No milk ... No wheat .. No rice. His diet is in stages, and it's limited even more so because he is still in the beginning of this process. But, it's helped bring my child back.

Yes, he takes many supplements, multiple times a day. Nu-Thera with P5P, Cod Liver Oil, Vitamin C, Magnesium Glycinate, Enzyme Complete DPP-IV, Melatonin, Zinc ... and Zantac at night for acid reflux. It's a lot, and more is about to be added shortly. But, it's brought my child back.

Three weeks ago, my son didn't use language. He had two words, "Car" and "Go" which he used without reason or meaning. The medical term for what he did is Echolalia. But, I felt blessed to just hear SOMETHING from him besides his shrieks and cries. I had no ideal my child's life was about to be drastically changed for the better ... in fact, I was fairly skeptical about the whole thing, honestly. I am thankful I went with my instincts and gave it a go.

The first week of the diet, we saw less aggressive behaviors and by far fewer accounts of him stimming. His eye contact improved greatly, and he would be able to sit for more than a second to attend to a task.

In the second week, he had begun picking up words. "Car" and "go" remained (and were used in context) and he added cup, cow, pig, ball, cat, dog, train, tape, CD, T.V., see, Chris, Sarah, Mom, Dad, baby, shoes, eye, ear, nose, mouth, and teeth. He also initiated an embrace for the first time in his life, twice in the same day. He still does this, and I want to cry with joy everytime he does.

In this third week, he has picked up even more words ... and I am so pleased to say that I couldn't even begin to list them all out. He now will ask questions, "What's it do?" or "What is that?" ... as well as when asked, "Chris, where is ____ at?" by responding, "Right there!" or "Over there!" He will put my shoes on and say, "See Chris' shoes!" and will tell me, "Chris' CD! (or tape)" to tell me he wants to watch one of his movies.

He is following directions very well, and doesn't for once seem "cloudy" when asked to get something or do something ... and will complete the task he is asked to do! Last night, I made him special cupcakes (really they are muffins, but I thought he might like calling them cupcakes for a special treat for him) and he waited for me to say it twice and then says, "Cupcake! MMMM! Good food!" and I laughed. That's my boy!

I would have never imagined my son could come this far so quickly. His sleep is much better, and he no longer has terrible under-eye circles ... he is gaining weight finally, and seems so alert. All of my struggles to do this diet and supplements have more than paid off, that's certain. When he looks into my eyes and asks me something I want to drop to my knees and thank God for that moment ... because I never thought I would hear him speak again--let alone be asking me a question!

I cried for so long and so hard that my child seemed to have been taken in the night ... and replaced with something resembling a zombie of sorts. I wanted to change things so badly, go back and figure out what caused this to happen to him and do it all over the "right" way. I felt such utter despair and heartbreak ... depression. I felt like an utter failure as a parent, and I felt responsible for what happened to him. I felt that I should have known the cause and kept it from happening to my beautiful baby boy.

I cannot change what happened. I cannot change the fact my son has autism. He will never be "neurotypical" in its entirety. He will still have issues in developing friendships and relationships ... he will always have issues about being in places with lots of people ... his eye contact will never be totally normal ... he will still struggle with being able to tell someone how he feels ... and some other things as well. But, he is coming back to me like he is. So what if he doesn't have perfect eye contact? After I said, "I love you Chris" to my son last night, he responded, "love you," and kissed me without being prompted. My heart rejoices and it's something I never thought possible to hear from my little angel. And, I did cry once again. Not from pain and anguish as before, but in joy and happiness.

Pamela J. Ferro concerning Isaiah's improvements on SCD after being on a gluten free/casein free (GFCF) diet

Note: GFCF is a diet which allows all foods, junk foods included, as long as the gluten is removed from the bread and from anything else ingested. Also casein is not permitted. The allergists support this diet because they believe these two proteins, gluten and casein, remain undigested in the gut, leak through the gut, and act on the brain as opioids. Children with a celiac condition are unable to digest the carbohydrates that are permitted on a GFCF diet.

Isaiah is a 12 year old boy with regressive Autism, having been born perfectly normal, and actually progressed ahead of schedule until a series of ear infections, oral antibiotics, immunizations, and an exposure to the wild virus strain of chicken pox caused Isaiah to suffer a loss of language, eye contact, joint attention, behavioral self-modulation, and a general ability to verbally communicate his needs, problems, and pain. He developed a severe and persistent gastrointestinal overgrowth of yeast, alternating constipation and diarrhea, food allergies, seasonal allergies, Autistic enterocolitis, and lymphoid hyperplasia that can be so painfully debilitating that it causes him to cry and scream, try to find physically comfortable positions, and miss many days of school.

Isaiah has been maintained on a strict casein and gluten free diet for the past six years, with variable and minor improvement. He continued to battle chronic yeast overgrowth, clostridia, and alternating diarrhea and constipation, abdominal pain, gas, bloating, and failed to progress in terms of acquisition of social and language skills to the degree it seemed he should. His tantruming, mood changes, and behavioral outbursts, in retrospect, were essentially all related to his state of bowel function and discomfort.

In a practice of treating well over 100 children with diagnoses of Autism Spectrum Disorders, I must say that despite rigorous implementation of the casein free and gluten free diet (or free from any identified IgG allergens), as well as informed supplementation, I have not seen children improve to the extent and in the fashion in which one would anticipate. These children cannot implant normal flora, eradicate clostridia or yeast. We see continuing deficiencies in nutrients, fatty acids, and amino acids, as well as on-going bowel problems, again, despite nearly heroic interventions to correct these problems, and heal the gut.

Since starting the Specific Carbohydrate Diet six months ago, Isaiah has demonstrated impressive progress. He has had a normal stool every day since the third day on the diet. On the one occasion that he was exposed to cake and ice cream, he developed diarrhea for two days, and cried for the entire time. When he resumed the SCD, the diarrhea and crying stopped, and have not returned. Not only does Isaiah have a normal, formed stool each day, he has made significant rapid progress in developing considerably more language, and utilizing much more complex sentence structure, appropriate pronouns, and spontaneous conversation. He has developed an interest in football, forsaking more juvenile interests, such as Thomas the Tank Engine.

He is now included for the full day in a sixth grade classroom with supports and in fact, he has become a champion speller. Last year, he spent 50% of his school time alone with an individual teacher because he could not stay in the classroom without crying, performing almost constant obsessive-compulsive routines and rituals, and being totally distracted. He missed over 50 days of school last year due to severe abdominal pain, crying, pacing, and screaming. Learning is difficult, at best, under those circumstances.

Other treatments have been helpful, such as oral immunoglobulin, B12 injections, complex supplementation, which were thoughtfully and knowledgeably implemented by Jacquelyn McCandless, MD, as well as social and educational supports implemented by a very supportive Special Needs Director, Ralph W. Tripp III, but nothing has brought my child so far, so fast as the SCD.

Although many things seemed to help him over the years, Isaiah was still so variable from day to day, that we had no real idea of what was working, and what wasn't. Now, he wakes up happy each day, ready to go to school, and his mood remains stable throughout the day. His mood is so consistent now, we know immediately if something is wrong with him. As I mentioned, he is able to participate in classroom activities daily, and even though the school year has just begun, all indications are that this will be a much smoother and productive year. Also of note is the fact that his sense of humor has blossomed; something that apparently is also difficult when one is in pain and struggling with gas, bloating, and knife-like stabbing sensations.

When Isaiah was exposed to one teaspoon of homemade goat's milk yogurt, he reacted in a very negative fashion. He cried for a day

and a half and was totally miserable, and had loose bowels for two days. This may have been because he was not following the SCD long enough for GI healing to have taken place. The other possibility is that when Isaiah was exposed to the cake and ice cream, we should have started from square one. The lesson in this experience however, probably is that children with ASD should take their time and not start the casein exposure prematurely, or parents may come to the erroneous conclusion that the "diet does not work." If the gut is not adequately healed, children on the Autism spectrum may have problems adding in the yogurt.

This SCD may well be the missing link for the many children, and perhaps adults, who have not adequately responded to the casein free and gluten free diet, and vigorous and informed supplementation. It seems to be having a very beneficial effect on Isaiah, and hopefully, will have the same effect of healing the gut, relieving the pain, and maximizing the developmental potential of children with ASD.

Update: For the first time, we were able to go to family parties with Isaiah calm and happy! In the past, this was impossible, as he was reticent to attend, and would scream and cry if we did attempt to include him. This was probably due to sensory integration problems, overstimulation, anxiety, pain, change of routine, and many variables. This was always a difficult time for my family since we are all very social people. Isaiah and I would need to stay home alone during the holidays, or leave a party after a very short time. This was at least as difficult for my older son, who enjoyed the parties immensely, as he either had to leave early or stay there with only his father, but without Isaiah and I. This created a lot of distress for the family, and a lot of turmoil for me, in particular, having to miss a lot of holiday time with my older boy.

This year, however, was quite the opposite. Isaiah joyfully attended a round of parties, and brought his own delicious SCD food. Things that would have previously sent him into a house-shaking tantrum no longer bothered him. Noises, lights, new people, different routines were not at all difficult for him. He still set limits on how many parties he was willing to attend, but we were able to fully participate in all the important family events. Quite the change!

Isaiah's ability to benefit from the academic and social environment in middle school has improved immeasurably. He actually requested to transition to middle school, despite our attempts to keep him in elementary school. We thought he needed to stay with the "little kids in a safer environment," but he would have none of it. He is doing very well in school, and no longer spends any time in the "sick room" with abdominal pain and screaming.

Although it takes a tremendous amount of time and commitment to be fully SCD compliant, for the first time I feel good about the food that I am giving my family. Not only has Isaiah benefited from SCD, but so have I and my typically developing 15 year old son Marcus. Isaiah can now tolerate butter used in cooking SCD cookies, crackers, and cakes. Right after the holidays, we will again attempt the goat's milk yogurt.

We have also implemented the SCD as the diet of choice for the children in our practice and we have observed many positive effects. I am sure as we come to understand more about the individual metabolic issues of people on the Autism Spectrum and more about the workings of the SCD, even greater benefit will be derived.