Alternative Veterinary Services, LLC

9 Hodges Street, North Andover, MA 01845

978-683-5775 fax 978-409-1269
http://AltVetServices.com

Office@altvetservices.com

GRAIN FACTS 2017

Martha C. Lindsay, MS, CNE

Many of you have noticed that your pets and possibly yourselves have improved your health in some way by not eating some type of grain or milk product. This handout is to explain why you saw improvement. The summary below is for those who are not that interested in the physiological mechanisms by which this happens. But for those of you who are interested in WHY grains can affect us badly, then read on after the summary below!

ARTICLE SUMMARY

Grains contain proteins, carbohydrates and fats. Many components of grains cause problems to non-herbivore animals and humans including lectins (such as wheat germ agglutinin), saponins, phytates, amylopectin A, gluten, and others. For example, lectins in grains are produced by the plants to kill insects and fungi so that the grain is protected and can serve as seed for new plants. Lectins are also toxic for dogs, cats and humans. They cannot be inactivated with the heat of normal baking or cooking but many can be inactivated by soaking the grains for some days before cooking or by pressure cooking. This handout explains in detail the physiological mechanisms that explain why our health improves when we stop eating grains.

SOME RELEVANT BACKGROUND DATA

Pre-Neolithic man did not eat grain and archeologists found less than 1% of teeth or bones in those skeletons had degenerative disease. Neolithic man started grain agriculture practices and archeologists found up to 47% of teeth were decayed, abscessed or lost and bone disease (osteoporosis) appeared.

2 grams of grain flour has enough phytates to almost completely block zinc absorption.

35-45% older adults have zinc deficiency.

In 3 ½ ounces of flour there are enough phytates to decrease iron absorption by 80-90%.

Gluten is in many cosmetics. We absorb whatever we apply to our skin just as if we ate it.

50% of persons with celiac disease (related to the sensitivity and damage from eating gluten) also have cross-reactivity to casein (the protein in milk and milk products).

The top 4 nutritional causes of childhood allergies are: gluten, casein (milk protein), eggs and soy

Autoimmune conditions are the #3 killer in the U.S. after heart disease and cancer – grains have proteins that look like mammal proteins and trigger autoimmune diseases of any kind (read on for explanation).

PROBLEM COMPONENTS OF GRAINS

Wheat Germ Agglutinins (WGA lectins are in wheat, barley, rye and rice) ---- if WGA is placed on intestinal tissue, it causes glycoproteins to stick to the intestinal cell walls and damage results that resembles Celiac disease; they are unaffected by boiling, frying, baking or our stomach acid, but can be inactivated by pressure cooking; when enough intestinal damage has occurred, undigested proteins including WGA's leak through the intestinal lining into the bloodstream and then the WGA's:

1) Cause red blood cells to clump together so blood clot potential rises increasing the risk of heart attack and stroke.
2) Activate cell division (cancer potential)
3) Enter fat cells and prevent fat release which stops weight loss and increases the body's demands for sugar to supply energy to our cells and our appetite is increased
4) Block leptin hormone (leptin turns off our appetite when our stomach is full)
5) Block vasoactive intestinal peptide (VIP) which (1) reduces our defenses against bad bacteria and parasites in the intestine,(2) increases cortisol secretion from adrenal glands (causing low energy, depression, insomnia, cravings) , (3) decreases protection from multiple sclerosis, (4) increases asthma and pulmonary hypertension, (5) increased intestinal inflammatory diseases (Crohn's, ulcerative colitis, celiac disease), (6) increased sleep problems, (7) reduces taste in tongue, (8) increases psoriasis
6) Bind with glycoproteins in gall bladder and pancreas so no hormones or bile are released for digestion ---- undigested food ferments and decays causing bloating, gas and stool changes; undigested food encourages growth of more decay-causing bacteria which produce toxins that cause inflammatory bowel diseases and poor nutrient absorption
7) Block intrinsic factor protein produced in the stomach stopping vitamin B12 absorption in small intestine (where 60% of all B12 is absorbed normally). B12 deficiency causes many problems such as: peripheral neuropathy, impaired, balance, nervous impairment, pernicious anemia, abdominal pain, enlarged liver, cherry red tongue, decreased concentration and learning ability to name a few.
8) Activate endothelial growth factor 1 ----which stimulates growth of cells lining artery walls, and growth of the smooth muscle cells of arteries, and activates cell stickiness for platelets, increasing the risk of blood clots
9) Impair heart muscle function by causing myocarditis
10) Disrupt skin ---- acne, seborrhea, psoriasis, eczema

Amylopectin A (a sugar in wheat, oats, barley, millet, sorghum, corn, kamut, rice, spelt, teosinte, emmer, quinoa, bulgur, triticale, amaranth) ---- this sugar is quickly digested and absorbed so it raises blood sugar higher gram for gram than table sugar does. High blood sugar causes the pancreas to release insulin which lowers blood sugar to normal. Repeated high blood sugar followed by low blood sugar over time leads to metabolic syndrome and type 2 diabetes and the following as well: dementia, anxiety, mental cloudiness, irritability, and hunger for more carbs. Amylopectin A is converted to triglycerides in the liver which leads to fatty liver and elevated liver enzymes over time.

The triglycerides in the liver are very low density lipoproteins (VLDL) which in the blood interact with large LDL particles and produce LDL smaller particles which are absorbed by inflammatory cells that line blood arteries. Now these blood vessel cells are more prone to glycation and oxidative damage and

atherosclerosis occurs (plaques, narrowed arteries, reduced blood flow to the heart and high blood pressure).

Bt toxin ---- sprayed on crops or in Genetically Modified (GMO) crops to kill insects; binds to human intestinal cells, damages them, allowing leakage of undigested foods into the blood;

Bt corn ---- is implicated in the deaths of cows in Germany, and horses, water buffalo and chickens in the Philippines.[17]

A note about GMO: Many seeds are genetically modified so the plant crop will be resistant to Roundup so that only the weeds in the fields will be killed. Glyphosate is the active ingredient in Roundup which is absorbed by the crop plants, too. So we are eating glyphosate with plants that are from treated fields. Glyphosate was also licensed as an antibiotic. It kills good and bad bacteria in our intestines and disrupts folate (an important B vitamin) synthesis by our bacteria.[14] The gene inserted into GM soy transfers into the DNA of bacteria in our intestines and our bacteria start producing GM proteins (pesticides) from then on.[16] Rats fed GM soy developed liver cell abnormalities and pancreatic enzyme reductions.[18,19] Glyphosate, like many antibiotics, also inhibits our body cell mitochondria (the energy producers for our cells) which stops any cell exposed to glyphosate from functioning.

Saponins (in all grains and seeds including quinoa, amaranth and buckwheat)--- bind to cholesterol molecules of intestinal cell membranes, disrupt the intestinal barrier and we see increased leakage of undigested food into the bloodstream; saponins can break down red blood cells if they get into the bloodstream across a "leaky gut"; traditional methods of soaking (fermentation) then fermentation can help eliminate most saponins but some require pressure cooking to inactivate them

Enzyme inhibitors --- are grain, seed and nut proteins that prevent our enzymes from digesting food; chronic consumption can cause pancreatic damage; can be inactivated somewhat by soaking, boiling or steaming and all can be destroyed by pressure cooking

Lectins ---- are glycoproteins in all grains (including quinoa, amaranth, buckwheat, brown rice), seeds (such as flax and chia), legumes (including beans, peas, lentils, soybeans and peanuts) and nightshade vegetables (tomatoes, peppers, eggplant and white potatoes) ---- they kill molds, fungi and insects; lectins are resistant to most cooking methods, all can be inactivated by pressure cooking and many can be destroyed by soaking for some days (changing the water every 8 hours and adding 1 Tablespoon lemon juice OR vinegar OR ½-1 teaspoon baking soda OR a 1- inch strip of kombu seaweed) then boiling; they are toxic to man in the following ways:

1) some lectins inactivate ribosomes which then stops protein synthesis in our cells
2) lectins are protease inhibitors which prevent protein digestion in the intestine
3) lectins destroy intestinal lining so that undigested food components then can move through the damaged intestinal lining into the bloodstream causing multiple food sensitivities and autoimmune diseases
4) hemagglutinin-lectin binds to carbohydrate receptor sites in intestinal cells which inhibits their nutrient absorption; standard cooking inactivates this lectin
5) lectins bind to glycoproteins on human intestinal cells and cause inflammation
6) lectins block hormone signals by disrupting glycoprotein hormone receptors (for example in the pancreas, stomach and gall bladder) which reduces digestion

7) lectins block Leptin (our satiety hormone that tells us to stop eating when the stomach is full)
8) lectin intolerance can show as sleep problems as well as digestive issues

Gluten (a lectin in barley, buckwheat, bulgur, corn, couscous, farina, graham flour, kamut, matzo, oats, rice, rye, semolina, spelt, triticale, wheat, wheat germ); sprouting the grain or fermenting the grain can reduce gluten content but no guarantees to remove all of it. Gluten is broken down into gliadin and glutenin by an enzyme in the small intestine called tissue transglutaminase (tTG). If a person is sensitive to gliadin, our immune system attacks it with antibodies. These antibodies also attack our own tTG. This is called autoimmune disease. tTG also holds together intestinal lining cells. When antibodies destroy tTG, the intestinal cells erode and allow undigested food through the intestinal wall into the bloodstream. Grain protein also activates zonulin in the small intestine which increases the spaces between intestinal cells so undigested foods can cross into the bloodstream. We then see allergic, autoimmune and other inflammatory conditions increase such as: acid reflux, allergic enterocolitis, allergic rhinitis, Addison's disease, ADD, ADHD, alopecia ariata, anxiety, amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease), ankylosing spondylitis, antiphospholipid antibody syndrome, atopic dermatitis, autoimmune hemolytic anemia, autoimmune hepatitis, autoimmune inner ear disease, autoimmune lymphoproliferative syndrome, autoimmune thrombocytopenic purpura, Behcet's disease, bipolar diagnosis, bullous pemphigoid, canker sores (aphthous stomatitis), chronic fatigue syndrome, chronic inflammatory demyelinating polyneuropathy, cirrhosis of the liver, cold agglutinin disease, CREST syndrome, Crohn's disease, cutis laxa, decreased serum protein, decreased ferritin levels, dermatomyositis, dementia, depression, diabetes types 1 and 2, discoid lupus, eosinophilic esophagitis, epilepsy, essential mixed cryoglobulinemia, esophagitis, fibromyalgia, food protein-induced enterocolitis syndrome, gall bladder diseases (such as primary biliary sclerosis or gall stones), Graves' disease, Guillain-Barre syndrome, Hashimoto's disease (an autoimmune thyroid disorder responsible for up to 90 % of all low-functioning thyroid issues), heart disease (cardiomyopathy --dilated or congestive), high or low HDL cholesterol, high or low total cholesterol, hypoparathyroidism, idiopathic pulmonary fibrosis, idiopathic thrombocytopenic purpura, IgA nephropathy, infantile colic, insulin-dependent diabetes (type I), juvenile arthritis, kidney disease, linear dermatosis, liver enzyme elevations, Meniere's disease, migraines, mixed connective tissue disease, multiple sclerosis, myasthenia gravis, myocarditis, neuropathies with normal EMG readings), optic neuritis, osteoporosis/osteopenia, palmar and plantar pustulosis, Parkinson's disease, pemphigus vulgaris, pernicious anemia, polyarteritis nodosa, polychondritis, polyglandular syndromes, polymyalgia rheumatic, polymyositis dermatomyositis, prurigo nodularis, psoriasis, purpura, Raynaud's syndrome, Reiter's syndrome, rheumatoid arthritis, sarcoidosis, schizophrenia, scleroderma, sinus congestion, Sjogren's syndrome, subclinical anemia, systemic lupus erythematosus, Takayasu's arteritis, temporal arteritis, trigeminal neuritis, ulcerative colitis, uveitis, vasculitis, vitiligo, Wegener's granulomatosis and many more.

Grain proteins ---stick to small intestine lining cells causing damage and death of the cells which absorb nutrients. This reduces intestinal absorption of vitamin D, calcium, folic acid, all the B vitamins, vitamin C and most water-soluble vitamins, iodine and most of the trace minerals (such as magnesium, boron, and zinc). So we develop malnutrition and diseases. For example vitamin C and calcium are the main components of collagen so without these the integrity of joints cannot be maintained and tendons and ligaments more easily break. A decrease in folic acid can cause depression and birth defects.

Grains contain other prolamine proteins (such as avenin in oats, zein in corn, secalin in rye, hordein in barley, and gliadin and zein in corn), glutenins, alpha amylase, and trypsin inhibitors -

1) Molecular mimicry ----grain proteins look like our own body proteins (ie. the transglutaminase enzyme in the intestine and synovial protein in the joints) in the liver, pancreas, intestinal lining, hypothalamus, pituitary, thyroid, joints, reproductive organs, joints, brain, skin and other organs. So when molecule grain protein go across the damaged small intestine lining into the blood, we make antibodies against the grain proteins and these antibodies also attack our own organ proteins. This is called autoimmune disease. Gliadin looks like the synopsin 1 protein of neurological tissue so that antibodies we make against the gliadin protein also attack our nerve cells around the body:
   (a) If nerves to the legs are attacked --- peripheral neuropathy
   (b) If the vagus nerve to the stomach are affected --- stomach loses ability to propel food into the intestine and we get rotting of food with belching, foul breath, and bloating as bad bacteria multiply
   (c) If brain cells are affected, signs depend on the brain area affected; these autoimmune effects in the brain can result in autism, seizures, tics, inappropriate emotions, repetitive behaviors (OCD), dementia (can also result from chronic high blood sugar), poor focus, decreased action and result connections, decreased short term memory, cognitive impairment, depression, anxiety, ADHD and ADD behaviors, stumbling, poor coordination
   (d) If nerves to the heart are affected --- abnormal heart rhythms, PVC's, atrial fibrillation
2) Gliadin protein --- interacts with macrophages in the intestinal submucosa contributing to autoimmune reactions there

Grain carbohydrate feeds bad bacteria in the intestines ---- overgrowths of bad bacteria can contribute to many disease conditions such as rosacea and other skin conditions, restless leg syndrome, IBS, Crohn's disease, ulcerative colitis, autoimmune diseases, diarrhea, constipation, diffuse muscle pain, nutritional deficiencies, fatigue, and inflammation in joints. Phytates ---Grains, seed, beans and nuts have high quantities of **phytic acid** in hulls or bran ---- they can be reduced 20-50% by soaking, boiling or fermentation such as in sourdough bread.

1) phytates bind to minerals so we cannot absorb the minerals; such as iron (causing anemia, fatigue, light- headedness, breathlessness), zinc (causing rashes, diarrhea, hair loss, decreased fertility, impaired growth, decreased neurological maturation), calcium, magnesium and vitamin B12.
2) phytates also disable the enzymes that digest protein and carbohydrates for us so we become malnourished; can be partially inactivated by bran removal, soaking for 24 hours or longer, sour fermentation or extended sprouting periods (except this actually increases phytates in alfalfa);

Grains inhibit omega 3 fatty acid absorption ---Omega 3 fatty acids help control inflammation. So we see increases in inflammatory diseases in the body.

Grain consumption increases blood acidity ---- then bones release calcium to neutralize the blood; the loss of calcium from bone contributes to osteoporosis and osteopenia.

Gliadin proteins ---- are digested into small peptides which penetrate the brain and bind to opiate receptors to cause the release morphine-like opiate neurotransmitters which mimic opiate addiction and we see

increased appetite for more carbohydrates. Over time of eating grain, we see reduced levels of B vitamins which are required to convert amino acids into brain neurotransmitters and we begin to see disruptions of brain function and decreased communication between the brain and the body. Some of the conditions that can result from this are: aggression, anger, anxiety, inattention, indecisiveness, insomnia, phobias, poor impulse control, sleep disruption, sleepiness, suicidal thoughts, unhappiness, mood swings.

Grains contain tannins which are difficult to digest unless soaked in acidic solutions.

Grain flours --- chlorine is used to whiten flours. The chlorine gas reacts with proteins in the flour to produce alloxan. Alloxan causes free radical damage to the DNA of beta cells in the pancreas and destroys them. Beta cells produce insulin which regulates our blood sugar level. This is why alloxan is used to create diabetes in experimental animals. Alloxan also increases liver weights in rats and mice. Food product labels that say "whole grain" actually are made with whitened flour.

SOURCES

1. Life Without Bread, Allan C. and Lutz W., Keats Publishing, 2000.
2. Dangerous Grains, Braley J. and Hoggan R., Avery Publishing, 2002.
3. Wheat Belly, Davis W, Avery Publishing, 2002.
4. Grain Brain, Perlmutter D., Little, Brown and Company, 2013.
5. Grain-Free Cure, Davis, W., Rodale, Inc., 2014.
6. "Grains: Are they Really a Health Food? Adverse Effects of Gluten Grains", Gedgaudas N., Well Being Journal, May/June 2012, pp. 3-17.
7. Nourishing Traditions, Fallon S. and Enig M., New Trends Publishing , Inc., 2001.
8. "Current Concepts: Celiac Sprue", Farrell R.J. and Kelly C.P., New England Journal of Medicine, Jan 17, 2002, 346, no. 3:180-188.
9. "Increased Prevalence and Mortality Risk in Undiagnosed Celiac Disease", Rubio-Tapia A. et.al., Gastroenterology, 2009, 137, no. 1:88-93.
10. "Wheat Next? Gluten Intolerance in You and Your Pet", Symes J., Well Being Journal, Sept/Oct 2006, pp. 14-19.
11. www.poisonousplants.ansci.cornell.edu/toxicagents/lectins.html
12. "Nutritional Remedies for Tooth Decay and Bone Health", Blair L., Well Being Journal, March/April 2014, pp. 10-20.
13. https:www//researchgate.net/publication/14029865_Ribosome-inactivating_lectins_with_polynucleotide_Adenosine_glycosidase_activity
14. "Folic Acid and Glyphosate: Synergistic Toxicity", Seneff S., Wise Traditions Journal, spring 2016, pp. 17-25.
15. "Avoiding Glyphosate in Feminine Hygiene Products, Moody, J., Wise Traditions Journal, winter 2015, pp. 51-53.
16. "Assessing the survival of transgenic plant DNA in the human gastrointestinal tract", Netherwood et.al., Nature Biotechnology 22:2, 2004.
17. The Documented Health Risks of Genetically Engineered Foods, Smith J.M., Yes! Books, 2007.
18. "Ultrastructural morphometrical and immunocytochemical analysis of hepatocyte nuclei from mice fed on genetically modified soybean", Malatesta M. et.al., Cell Struct Funct. Vol. 27, pp: 73-180, 2002.
19. "Ultrastructural analysis of pancreatic acinar cells from mice fed on genetically modified soybean, Malatesta M., Journal of Anatomy, Vol. 201, Nov. 2002, p.409.