FOOD INTOLERANCE AND ALLERGY
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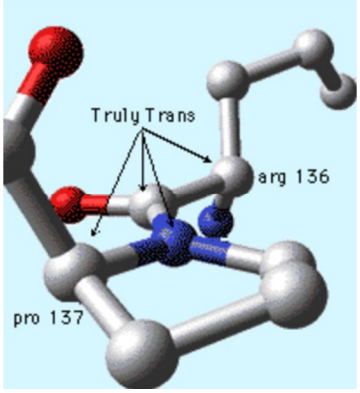
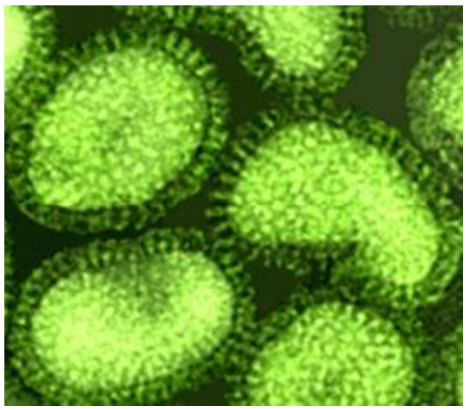
Hippocrates was born on the island of Kos in Greece in 460BC. He is recognized as the founder of modern medicine and medical graduates around the world swear a Hippocratic Oath at their graduation to follow the ethical principles laid down by Hippocrates. His medicine today would be considered as "alternative" or "natural" medicine and its fundamental thesis was that
"All disease begins in the gut".
This is the thesis I am presenting in this lecture.



Proline
The key parameter in my presentation is the role of the amino acid proline, which is unique amongst the common amino acids that make up the structure of proteins, in that it causes the protein chain to be fixed in a 90° bend. Proteins are normally very flexible and can adapt their three-dimensional structures to fit a particular protease enzyme's active cavity so that the protein can be digested. The fixed structure imposed by the proline makes it impossible for the usual protease enzymes to digest proline-rich proteins and that includes the protease digestive enzymes in our bodies. If our bodies cannot digest a protein, that protein becomes a threat and our immune system looks to destroy it and it will become hypersensitized if it has the gene that recognizes a proline-rich proteins.



Protection
Viruses and bacteria evolved long before man. For those organisms to function and to invade hosts such as the earlier evolving animals, they expressed on their surface membranes proteins that could not be digested within their hosts. **An influenza virus is shown on the left.** The hairs on the surface are two proline-rich proteins called hemagglutinin and neuraminidase that interact with host cells to allow the virus to enter the host cell and multiply. The hosts' digestive systems cannot remove these proteins from the virus' membrane. Over the evolution of these organisms they have conserved their prolyl peptides in these proteins while undergoing regular mutation and changes to the other amino acids in the proteins' structures.

Throughout the evolution of **Homo sapiens** up until the end of the last ice age and the Palaeolithic periods 10 thousand years ago, those people with the HLA DQ2 or DQ8 immunity gene that gave them an innate immunity to proline-rich proteins on the membranes of viruses and bacteria, became the dominant proportion of people on earth. People with different immunity genes succumbed to these micro-organisms. The Palaeolithic people selected their food carefully so they remained healthy and ate mainly lean meat, seafood, starchy tubers such as yams, some leafy vegetables, some fruit and some nuts all of which did not make their immune systems hypersensitive and cause autoimmune diseases. Our aboriginal people came from the same genetic stock and were healthy and fit before Europeans gave them wheat flour and alcohol. Prior to the Europeans, they chose their food very carefully to ensure they remained healthy.

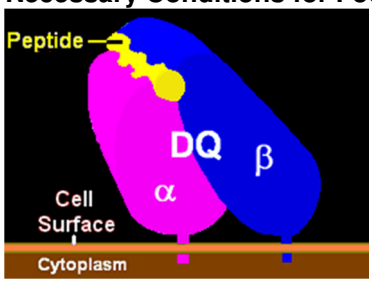
The other animals evolved to have similar immunity genes to Homo sapiens.

When plants evolved, they protected themselves against animal predators including insects by laying down proline-rich proteins within their structures. They encapsulated their starch, oils, vitamins, minerals and even their main flavour components within a capsule coated with proline-rich proteins (see below). Palaeolithic man was able to select through trial and error natural plant foods that were available that did not hypersensitize their immune system and make them sick.

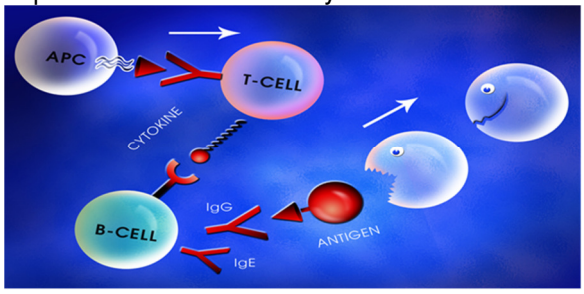
A major change in the evolution of mankind occurred at the end of the last ice age 10 thousand years ago. New grasses grew all over the world: a corn variety in the Americas, rice in Asia, and wheat near the Black Sea. People recognized that these new grasses could be easily cultivated, that the grains gave excellent flour, and that wild yeasts were able to make alcohol from the flour. The people also recognized that these grains were a good feed for animals and it was now possible to domesticate cattle and other animals on a large scale. This was the beginning of agriculture and the concept of agribusiness: these grains, their flour, the alcohol and the domesticated animals and their milk could be traded. Income became more important than the health impacts of the food on man and the animals. Sadly wheat and corn had high concentrations of proline-rich proteins. Rice proteins were not so bad and could be more easily digested. Wheat was traded in a westerly direction because rice was successful in the east. The people with the special gene that recognized proline-rich protein progressively died off from autoimmune diseases and a reduced fertility reducing the proportion of people with this special gene. People in Africa recognized the problem, and when wheat entered Africa, they learnt to remove the problem by fermenting the grain before using the flour. Some tribes refused to eat wheat in modern Lebanon, in Sardinia, and in the Celtic regions of western and Northern Europe. The proline-rich foods have only been introduced to these people's diets in relatively recent times and the HLA DQ2/8 gene still dominates. This gene has been re-introduced into Eastern Mediterranean and Eastern Europe countries over the past few thousand years through the Mongol invasions and the movement of people from Africa and the Middle East into these regions.

The HLA DQ2/8 gene is handed on to progeny 100 percent and so in a country such as Australia, those people with this gene mostly come from the Celtic and Eastern Mediterranean peoples as well as from Asia, Africa and our own Aboriginal people. The percentage varies across the country with high percentages where Scots settled such as in Tasmania, and for example in New England, and where the Irish settled, and where there are high numbers of people with Aboriginal or Islander descent. The percentage is certainly greater than 30 percent averaged over all of Australia. These are the people who at very high risk of food intolerance, and the associated autoimmune diseases including the full range of cancers.

Necessary Conditions for Food Intolerance



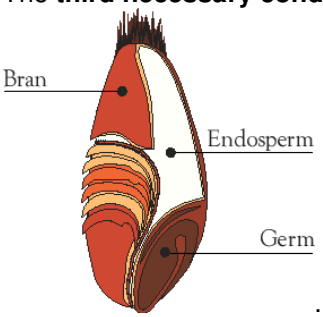
To suffer from food intolerance, three conditions are necessary. The **first necessary condition** is that you have to have the HLA DQ2 or DQ8 gene. The immunity gene expresses a pair of associated proteins that have a cavity with a geometry that allows a specific antigen to be bound and for DQ2/8, this has to be a proline-rich peptide. The pair of proteins and the bound antigen are expressed on the membrane of a special white cell as depicted in the figure to the left. This causes the release of immune T cells and B cells designed to respond to this protein complex. The T cells express molecules called cytokines that activate the B cells to express antibodies such as IgG or IgE that target the antigens to remove the threat through macrophages taking up the antigen-immunoglobulin complex..

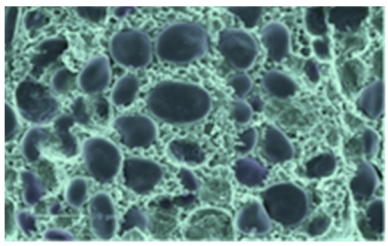


The **second necessary condition** for food intolerance is your immunity gene has to be activated. It may never be activated in your whole life. Your **first serious infection** will cause an immune response, for example, an influenza or scarlet fever infection. Your HLA DQ2/8 gene will prevent you having a second infection, irrespective of which virus or Gram-positive bacterium you are exposed to. **Vaccination** with a proline-rich membrane protein or a live vaccine will turn on your HLA DQ2/8 gene, and in Australia the very successful vaccination program has turned on the HLA DQ2 or DQ8 gene in those children with the gene under 20 years of age in 2013. The vaccination program is very important for the total population to reduce the risk of major outbreaks of serious diseases, but it is also important for governments and the medical profession to understand that for a very significant proportion of the population with the food intolerance gene, they are now at a higher risk of having their immune system hypersensitized at a much earlier age than in the past (before the effective vaccines were created) by the food they eat daily and they are at a higher risk of having autoimmune diseases early in their lives. **Stress** including stress from over-exercise will turn on your immunity gene.

If a pregnant mother has food intolerance, her new-born baby will emerge into this world with its HLA DQ2/8 gene turned on. This presents a serious problem. Some babies smell the casein in the breast milk, which is a proline-rich protein, and the baby refuses to latch on to its mother's breast. Others drink their mothers' milk and react badly with colic, vomiting and fits. The necessary calcium and phosphorus and other nutrients are not taken up. Often the solution provided is a milk or soy formula which is far worse. Thankfully, one drop of a ginger solution we have developed put under the baby's tongue before each feed overcomes the problem instantly.

The **third necessary condition** for food intolerance is you eat food with proline-rich proteins





Electron micrograph of barley endosperm with starch granules (grey) embedded in protein matrix (green). Adapted from Black (2001)

Wheat is given most of the blame. It has about 50 percent of its proteins proline-rich. They are called gluten proteins. Other cereals such as barley have similar proteins. They encapsulate the starch, the minerals and their vitamins in a capsule stopping you gaining access to their energy source necessary for germination. If your HLA DQ2/8 gene has been turned on, your immune system detects the proline-rich proteins such as gluten and if you eat wheat or other cereals each day, you are effectively being vaccinated each day. The same applies to other proline-rich foods.

Your immune system becomes hypersensitized and your health is compromised. Your digestive enzymes cannot digest gluten and related proteins and this encapsulated energy passes into the hind gut where bacteria ferment it making your hind gut become acid killing off your good gut bacteria and allowing your bad bacteria to prosper putting toxins and different to normal fatty acids into your blood.

The second food people blame for food intolerance is milk from cows, goats and sheep. The health industry often blames lactose but this is a relatively small problem in Australia, specifically for people with the autoimmune disease called Coeliac Disease who have had their small intestine villi, where lactase is produced, seriously damaged and for people who have not been given animal milk after weaning from their mother's milk and their body has forgotten how to produce lactase. The latter problem is common for people from Asia. All people with food intolerance react to milk's proline-rich proteins called casein and beta-lactoglobulin if their gene is turned on. In Australia this is over 30 percent of the population.

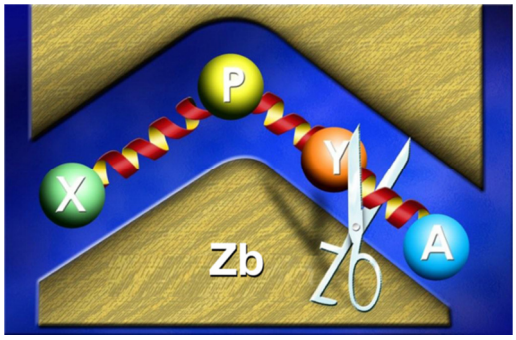
People with food intolerance often go on a gluten-free and dairy-free diet, but this does not solve the problem. As stated above plants lay down proline-rich proteins to protect them against predators. People often tell me they only eat healthy vegetarian food and cannot understand why they still have food intolerance. The answer is simple: a vegetarian diet is not necessarily healthy for a person with food intolerance because many of the so-called healthy foods are rich in proline-rich proteins with structures even worse than gluten, for example carrot and beet root (see figure below). Special mention should be made of Spirulina which is hailed as a very healthy product but it has an exceptionally high level of proline.

PROLINE-RICH PEPTIDES IN SOME FOOD AND DRINK PROTEINS

Wheat
.. QPFPPQQPYPQPQPFPSQLPY..
Barley
.. PTPLQPQQPFPQQPQQPLPRPQQP..
Milk
.. QPTTMARHPHPHLSFMAIPPK..
Wine
.. CPSPSPPKPPKVKHPLPPLPPKHPPH..
Carrot
..CPDPYKPKPKPTPKPTPTPYPS..
Tomato
..CPYCPYPPSTPKHPKLPPKVKPPS..
Onion
.. NPGLRRNPRFQNIPRDCRNTFVRP..
Lentil
.. KPPVYKPPVEKPPVYKPPVVKPP..
Capsicum
.. EPPKPKPPEKPKEPEKPKQPEKPK....
Grapefruit
PPPEPKKPK..
Beetroot
..RPSRPTPPRPPTPRPPPPRPPTPRP..
Asparagus
..CPHCPPTTIPTHPPTTKPIDPPTHRPHPPK..
Soy
.. PSHPPRRPS..
Peanut
.. DPYSPSDPYSPSQDPDRRDPYSPSPY..
Coffee
.. QPFRPPPSPLPPQ..
Chocolate
.. NPYYFPK..

P proline P where ginger enzymes digest protein

The Biohawk Solution
The aim was to find a food that was rich in an enzyme that was designed by nature to specifically and efficiently digest only proline-rich peptides. A special blend of rhizomes from the ginger family was found to be able to do the job and digest proteins such as gluten and casein making it safe for people to eat bakery products made from wheat flour and to drink milk, and the hind gut was brought back to neutral within 3 days according to studies with race horses. A small amount of the Biohawk ginger was able to digest the proline-rich proteins in all these other foods.



The ginger enzymes are unique in their specificity and efficacy in digesting the proline peptides with a hydrophilic amino acid next to it. The cavity in the ginger enzymes which binds the protein resembles closely the HLA DQ2/8 gene cavity and is able to digest the protein one amino acid away from the proline. Only a bent protein at proline (P) can fit in the active site. This applies to all proline-rich proteins: food proteins, the membrane protein on viruses, bacteria, and cancer cells, and proline-rich toxins such as prion, the cause of mad cow disease.

The digestion of food proteins improves the nutrition of these foods substantially for all people and animals.

Foods that cause food intolerance include all cereal grains including chia, all legumes, all animal milk including human milk, many vegetables and fruits including their juices, coffee, chocolate, wine, whisky and beer. Asians ferment soy to overcome its problems. Eastern Mediterranean people condition their legume grains such as chick pea and lentils. The problem can be easily removed by

treating each of these with the Biohawk ginger products. See Helpful Hints for Food and Drink. The digestion of the milk casein means there is no longer a difference between a1 and a2 milk:
YPFPGPIH **Beta casein a1 (bovine casomorphin 8 with BCM7 underlined)**
YPFPGPIP **Beta casein a2 (bovine casomorphin 8 with BCM7 underlined)**
Casomorphin 8 is the only difference between a1 and a2 milk, and is the key peptide of concern. For both forms of milk, casomorphin is digested by Biohawk's ginger between F and P eliminating this problem casomorphin. The ginger digests the casein (and beta-lactoglobulin) much more extensively than at the casomorphin making the milk much more nutritious.

There is a very long list of symptoms of food intolerance. The most common are:

- Reflux & excess wind
- Gut pain
- Diarrhoea or Constipation
- Tiredness and chronic fatigue
- Fuzzy head
- Fat on women's bottoms, thighs & breasts
- Fat on men's 'stomachs'
- Allergies

Examples of autoimmune diseases that are caused by food intolerance:
A few percent of people with food intolerance have **Coeliac Disease** which causes significant damage to small intestine villi that are involved in the uptake of nutrients in the small intestine. The failure to take up nutrients means the people are usually very thin with no fat laid down as listed above. The alpha protein in the HLA gene is slightly different to that in other people with food intolerance and people with CD have a severe reaction to gluten as they utilise tissue Transglutaminase to deaminate some glutamines in the gluten proteins so they bind more strongly to the gene than for the other people with food intolerance. People with CD react to the other proline-rich foods and it is not sufficient to have a gluten-free diet.

Children with **Autism Spectrum Disorder (ASD)** as distinct from children without this condition have in their urine peptides from proline-rich proteins such as gluten and casein (see papers by Karl Reichelt). One of the theories for ASD is based on these types of peptides inflaming the brain. Children with ASD who take the Biohawk ginger preparation and only eat food where there are no proline-rich proteins or the proteins have been digested by the Biohawk ginger rapidly show major improvement. These preliminary results have led to a combination of groups who specialise in autism in Norway to undertake a formal clinical trial using the Biohawk ginger preparations.

Cancer genes are turned on by a hypersensitized immune system and food intolerance is one of the main causes of this condition. Cancer cells express on their membranes proteins that are proline-rich and which often have a high level of homology with food proline-rich proteins such as gluten. For example, a highly expressed protein from breast and other cancers is SATB1 which has over 50% homology with gluten proteins. The breast cancer androgen receptor has a similar structure. Interestingly the gene for Dementia with Lewy Bodies also is related. All are susceptible to digestion by the Biohawk ginger.

Homology of autoimmune disease proteins with wheat proteins

DLB	QQQQLPQQQQQQPPQ QPPQQPQQQDSVWGMNHSTLHSVF QTNQSNNQQSNFAVQ
SATB1	QQQQQQQQQQQAPPPPQPQQQPQT GPRL PPR- QPT VASPAES DEENRQKTRPR
Gliadin	QQQQQQQQQQQQPLSQVSFQQPQQQ YPSGQGSFQPSQQNPQAQGSVQPQQL PQ
LMWGlu	QQQQQQQQQQQQPPFSQ- QQQPVLPQQPPFSQQQQPPFSQ QQQPSSQ QPPFP Q
BCAndR	QQQQQQQQQQQETSPRQQQQQQGEDGSPQAHRRGPTGYLVLDEEQQPSQPQ

DLB = Dementia with Lewy Bodies PARK11 gene
SATB1 = over-expressed protein from breast cancer
Gliadin = wheat protein
LMWGlu = wheat protein
BCAndR = Breast cancer androgen receptor
P = proline where ginger cleaves
Q = glutamine
S = serine

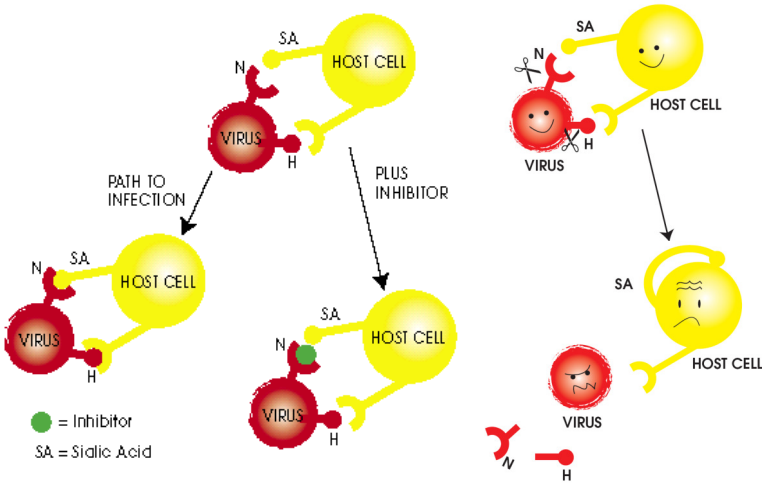
Eczema is a common autoimmune response to food. The digestion of the food proline-rich proteins can quickly control the problem:

.SEVERE ECZEMA BEFORE AND AFTER DIGESTION OF FOOD PROLINE-RICH PROTEINS

Scientific studies have shown the link between food intolerance and many autoimmune conditions. A few of these are diabetes, rheumatism, Crohn's Disease, Schizophrenia, depression, epilepsy, Lupus, thyroid disorders, and multiple sclerosis. Treating the food intolerance can greatly assist in controlling the health condition.

VIRUS PROLINE-RICH PROTEINS

As mentioned above, proline-rich proteins are expressed on all virus membranes and are intimately involved in the reproduction of the virus in the host's cells. For example, the influenza virus has two types of proline-rich proteins on its membrane, hemagglutinin (H) and neuraminidase (N).



The influenza virus invades a host cell by initially binding to receptors on the host cell, one of which binds to the hemagglutinin (H) on the virus, and one with sialic acid (SA) which binds to the neuraminidase (N) protein on the virus. Current inhibitors for influenza virus are designed to mimic the sialic acid and to bind to the neuraminidase blocking the link to the host cell. The neuraminidase structure changes regularly and the inhibitor will not bind equally as well to the neuraminidase for each mutation of the virus. The Biohawk ginger product acts like pair of scissors and specifically cuts off the hemagglutinin and neuraminidase proteins from the surface of the virus completely preventing the virus infecting the cell and replicating itself.

The influenza virus mutates regularly changing the amino acids in the two membrane proteins, but the virus conserves the prolines to protect it against attack by other enzymes and to conserve structural elements in these receptors. To illustrate this a segment of the hemagglutinin protein is reproduced

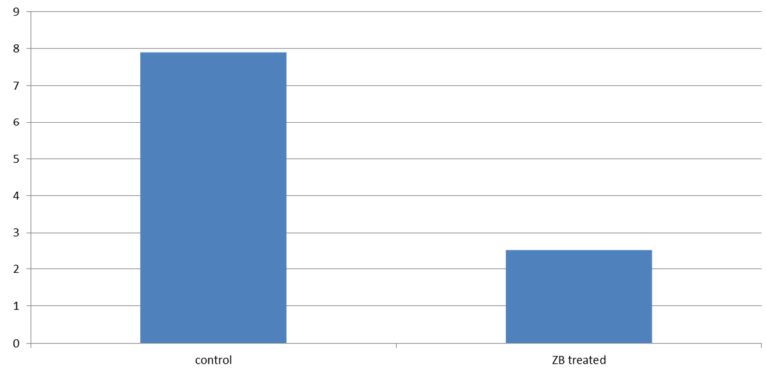
for a number of important influenza viruses. The yellow highlights where the ginger enzyme digests these Proline-containing segments. This conservation of the proline peptides is repeated throughout the proteins' structures. "Z" in the H5N1 denotes where the amino acid is not conserved but it is a hydrophilic amino acid in the three variants and allows the ginger enzyme to cut the protein there. The recent bird flu, H7N9, looks to be a primitive form because in the whole structure of these proteins it has many more variations than the others.

SEGMENT OF INFLUENZA HEMAGGLUTININ

bird flu H5N1 (3 variants)	VPZIATRPK
swine flu H1N1 (swine)	KPEIAERPK
swine flu H1N1 (human 1991)	TPEIAERPK
swine flu H1N1 (human 2009)	KPEIAI RPK
influenza A H1N1 (human 1918)	TPEIAARPK
equine flu H3N8 (bird, human, horse)	I PNIGSRPW
bird flu H3N2	I PNIGSRPW
bird flu H9N7	KPVIGPRPL
bird flu H7N9	VPSPGARPQ

The Biohawk ginger has been tested by a number of the leading virus laboratories in terms of its ability to inhibit viruses including the H5N! bird flu. The result from one study is shown in the following figure:

H5N1 AVIAN INFLUENZA ZB GINGER INHIBITION
INCUBATED EMBRYONATED CHICKEN EGG ASSAY
4 HR INCUBATION AT 37C WITH ZB AT 450U/mL
log$_{10}$ EID$_{50}$ /mL



Papilloma virus shows a similar conservation it its prolyl peptide groups in its many variants of its membrane proteins. The most common variant's membrane protein structure is shown below with the yellow highlights identifying the peptides where the ginger enzyme can digest the protein:

PAPILLOMA VIRUS HPV2a

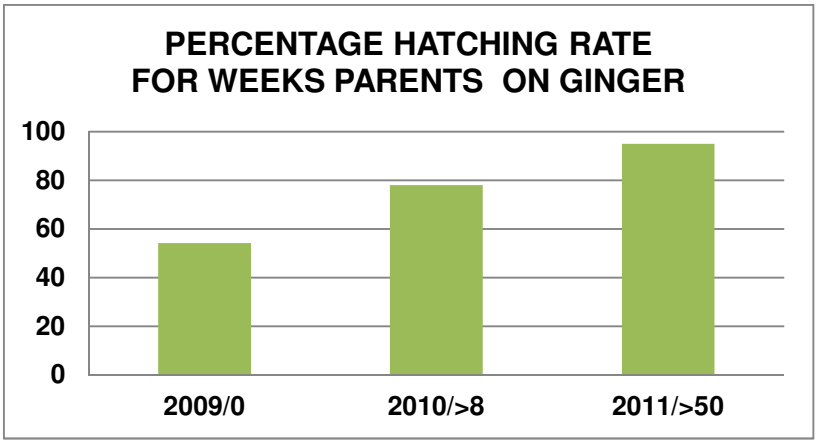
1 MALWRPNESKVYLPP.TPVSKVISTDVYVTRTNVYYHGGSSRLLTVGHPYY
51 SIKKSNNKVAVPKVSGYQYRVFHVKLPDPNKFGLPDADLYDPDTQRLLWA
101CVGVEVGRGQPLGVGVSGHPYYNRLDDTENAHTPDTADDGRENISMDYKQ
151TQLFILGCKPPIGEHWSKGTTCNGSSAAGDCPPLQFTNTTIEDGDMVETG
201FGALDFATLQSNKSDVPLDICTNTCKYPDYLKMAAEPYGDSMFFSLRREQ
251MFTRHFFNLGGKMGDTIPDELYIKSTSVPTPGSHVYTSTPSGSMVSSEQQ
301LFNKPYWLRRAQGHNNGMCWGNRVFLTVVDTTRSTNVSLCATEASDTNYK
351ATN FKEYLRHMEEYDLQFIFQLCKITLTPEIMAYIHNMDPQLLEDWNFGV
401PPPPS ASLQDTYRYLQSQAITCQKPTPPKTPTDPYASLTFWDVDLSESFS
451MDLDQFPLGRKFLLQRGAMPTVSRKRAAVSGTTPPTSKRKRVRR

Active common warts are associated with this variant of the Papilloma virus. If the virus is killed, the wart is no longer able to grow. The following figure shows how quickly this can happen when the virus' membrane protein is digested by the ginger enzyme in a topical cream:

COMMON WART TREATED WITH ZB GINGER
3PM SUNDAY 9AM MONDAY

IMPACT OF FOOD INTOLERANCE ON FERTILIZATION

Experiments with about 20 varieties of chickens has shown that if the parents take the ginger enzyme in their water supply, the fertilization and hatching rates as a percentage of the eggs set increase markedly depending on the length of time the parents have access to the ginger:



For one variety, roosters who had not fertilized an egg for 3 seasons, after being on ginger for a year all had a 100% success rate. Good nutrition is probably required for good sperm.

Biohawk is keen to work with researchers who are interested in overcoming the effects of food intolerance in humans on successful reproduction. The hypersensitized immune system could well cause the loss of an embryo. Our observations suggest mares on feed that would cause food intolerance tend to "slip their foal". As the percentage of people at reproductive ages with food intolerance increases especially as the age of people who have had a successful vaccination program increases, there will be an increase in the number of couples who have problems with reproduction. Controlling the food intolerance may be a solution.

Conclusion

Cobb 308 chickens (day 29) identically housed and fed with chicken on left on ginger in water.

The chicken on the right which is the one you usually buy has diarrhoea, its bone and ligament structures have been distorted to the degree that it cannot stand for too long and exercise, it has not matured correctly, and it has much fat under its skin. Whereas the chicken on ginger has beautifully strong legs, no diarrhoea, minimal fat under the skin, well matured, good breast muscle (15% more for the same carcass weight), 17% greater carcass weight, no stress and enjoys exercising regularly.

WHICH CHICKEN DO YOU WANT TO BE?

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