

Dr. Ron Ehrlich: Hello and welcome to “Unstress”, I’m Dr. Ron Ehrlich. Animals are an important part of our lives. They always have been. Whether we're talking about going back in time to the beginning of the human journey and our relationship with animals as a food source or more recently in human history as a domesticated animal and companion. We've got lots to learn about them and from them and in many ways their health is a reflection of our own health.

As a general rule, I think we could say that what is good for an animal's health is generally good for our health and most likely the health of the planet. My guest today is Dr. Ian Billingshurst. He's a nutritionist, an agricultural scientist, a veterinary surgeon an author, a lecturer, a nutritional consultant and a fascinating guy. In fact, his latest book is called “Pointing the bone at cancer”. There are so many interesting parallels here between our own health journey and those of our domesticated animals. I hope you enjoy this conversation I had with Dr. Ian Billingshurst.

Welcome to the show Ian.

Dr. Ian Billingshurst: Thank you very much. It’s good to be here.

Dr. Ron Ehrlich: You've written this book “Pointing the bone at cancer” and it’s something we really want to talk about today obviously, but I wondered if you might share a bit of your own journey professionally, personally that got you to this point.

Dr. Ian Billingshurst: Well, yes, it's a long story, 74 years of age. It hasn't been a rapid journey. I started off at an agricultural high school then I did agricultural science at University where I learned a lot about the nutrition of farm animals and agronomy and there were my major subjects. And then I went and became ironically an agronomist at Orange Agricultural Research Station where we were looking at potatoes, which I now regard just as almost pure sugar when you look at them. But I didn't feel particularly satisfied in that role, so I entered the education sphere and went teaching for approximately four years during which time I did a DipEd. And in that period in the DipEd one of the most important books I read was by Karl Popper and it was the “Philosophy of science” and that was intriguing. That stayed with me for a long time and I won't go into that now because it's rather in-depth stuff.

But I was yearning to be something either a doctor or a veterinary surgeon and the reason I wanted to do that was because ironically again I was out as a young man in my early twenties, newly married actually and we were shooting rabbits and I rather enjoyed cutting them open after they had been shot and pulling their intestines out and dressing and feeding them to the dogs and to the family and all that sort of thing. Now I can't do it of course. I can't shoot anything.

So, a long story short again I entered veterinary science and became a veterinary surgeon. During that course we were taught nutrition for companion animals and I thought “This is going to be fantastic” but it wasn't because the bottom line was and I was actually taught this by an agricultural science graduate would you believe in the veterinary course that the bottom

line to feeding companion animals was to be able to read and if you had a packet and it said this was a complete and balanced diet or a tin or whatever the supposed food was in, this was all you had to know. That was the bottom line. So, this was highly unsatisfactory when I got out as a newly graduated veterinary surgeon. I said that was one of the most common things people asked me particularly if they had a puppy or a young kitten how do we feed. What do we feed? And I was rather in a state of perplexity, so I gave them some disjointed account of well we were taught to say processed pet food, but my experience is to tell them what I used to do. And what I still did. In any case, our family went into taking dogs to shows and I was told by those who must be obeyed within the family we're going to start feeding our dogs the proper way with processed food because that's the correct way to feed them.

Well, over the next two years I watched my own animals deteriorate and it was dreadful, and I had to start treating my own animals for the first time for all sorts of things. Hair problems, skin problems, allergies and we had a breeding dog who had growth problems.

At the time I was studying acupuncture and I was meeting a whole heap of people and they really introduced me to the idea that hey what I'd been doing long ago was far more correct and much closer to the truth. I started looking at feeding dogs just what was available in the way of raw food that I knew about. Raw meaty bones, chicken necks and wings, household scraps and behold my own animals became healthy again.

Well, this ends up with a book called "Give your dog a bone" from which I was invited to speak in England and then we did that and from there the internet was just beginning and the whole thing was going mad and somebody had coined. I had looked at the people on the internet who had read my book and were now feeding raw and enlighten them to evangelising Christians. So, they were called "born-again raw feeders" and this was conveyed to me. I looked at what was going on the internet and it was quite frightening because some people were quite vitriolic in their enthusiasm and there was the opposition and so on.

Anyway, and then this lady herself who was watching these people feed this way, she said, "I might give it a go" and she did, and it worked for her. So, she now said, "Well, it's bones and raw food, not born-again raw feeders". This was an acronym bath. I looked at this one, it was conveyed to me and I said, "Let's go more scientific biologically appropriate raw food". Well, from there yes, I was invited to England, then the States. We did three months in the States touring every major city across the States. From that time on I've written several other books "Grow your pups with bones" for breeders, "The Barf diet" and then a huge gap to this latest book "Pointing the bone at cancer".

My whole journey has been a personal one of growth in the area of nutrition and I realised very early on as I watch animals transform in the practice that I had, small companion's animal practice. If I could persuade the owners to drop the processed food and begin to feed real whole raw food based mostly on raw meaty bones and offal and healthy food scraps those dogs and cats transformed.

My whole journey from that point apart from being a conventional veterinary surgeon has been to learn about nutrition and that's where I am today.

Dr. Ron Ehrlich: Well, what a journey. A couple of things kind of jump out at me there that the influence on you as a student and a young professional, not just young professional whether you could have kept on going it was through this science learn to read a label, processed food is the way of the future and then you look at our food pyramid for us as humans and the influence that the USDA whose job it is to sell agricultural products primarily, the influence that that's had on human nutrition. This parallel path of processed food and its impact is an interesting one.

Dr. Ian Billingshurst: Yes. The latest book I've written is for both humans and animals but early on when I spoke to clients there was always a hidden agenda in my work because they would say to me "But does this apply to us as well?" and I said, "Yes, of course, it does". People would change their own lifestyle and their own habits based on what I was seeing in their dogs and cats as a result of changing their diet.

The problem we have is those young students today, veterinary students are totally captured by the ethos of the USDA and AAFCO - American Association of Feed Control Officials, where we are feeding companion animals the most atrocious food, but it's based on feed standards for livestock but not to make them healthy but simply to grow them as quickly as possible for an early death. We are now feeding food which to our companion animals based on that ethos and we do grow them rapidly with high carbohydrate diets and all that sort of thing and anything that's grown rapidly does have an early death and we know so much more now. Back then I said to myself "Well, I had to find out why it is that this food is so dreadful in terms of degenerative disease". In terms of things like arthritis, autoimmune disease, kidney failure and so on and so forth and not to mention cancer why it is. And of course, over that length of time and particularly in the last ten years and most particularly in the last five years, the amount of information we're getting is absolutely enormous and we now know that most degenerative diseases are based on energy production. It comes back to mitochondria and most of them are actually based on mitochondrial malfunction.

Dr. Ron Ehrlich: Yes, well we're going to get into that which was my next question and that was "Pointing the bone at cancer", explain the title.

Dr. Ian Billingshurst: I've spoken to young Australians and not a lot of them know this, but old Australians all seem to know it. In our Australian Aboriginal population in times gone by any miscreant or male who had done really bad things. Instead of being punished physically, it was punished mentally by pointing this bone that the miscreant, that the wrongdoer believed had such power that it would kill them.

When the bone was pointed by the Khadija man or witch doctor or whatever you want to call this person within the community, that person then gave up basically and they said there was a cognitive situation or process was set in train and that person just quietly faded away.

In pointing the bone at cancer, the bone becomes a symbol for evolutionary nutrition or sound nutrition or genomic nutrition in general what I eventually call in the book "Targeted nutritional therapy". The whole thing is that when we start using nutrition as a tool to defeat cancer and in fact most other diseases of degeneration if it's done properly, in other words, it's genome-based, the problem quietly disappears rather like the death of the individual at whom



the bone was pointed in Australian Aboriginal long-term folklore or long-term cultural practices. So, that's what the book title alludes to.

Dr. Ron Ehrlich: Now in the book you talk about our current understanding of cancer is incorrect and this is the theme that we've been pursuing in this podcast over the last couple of weeks anyway and will continue to do. Can you explain that? What's the current state of understanding and where have we gone wrong?

Dr. Ian Billingshurst: Okay, the current state of understanding is kind of hard truths. We know that carcinogens and the carcinogens can be chemicals, radiation and infective organisms like bacteria and viruses more particularly viruses but also some bacteria and also lifestyle can all act in a way that impacts, this is a "can't believe" as carcinogens, they impact the genome of the nucleus. This is a "can't believe". They cause mutations directly to the genome and these mutations to growth-controlling genes. So, in broad terms there are growth accelerators and there are growth inhibitors and they call the growth accelerators oncogenes and the growth inhibitors well they're just genes that put a brake on cell growth. There are two very important ones one called p53, the other is retinoblastoma.

The belief is that if we can target and this brings us to the smart drugs just forget about the dreadful things we did to our patients with chemotherapy and radiation and mutilating with surgery in many instances. Forget about that for the moment. But we now got these things called smart drugs and these smart drugs either target the gene that has been mutated and there are mutated genes and they are driving cancer, but we'll come back to where that is. They target that gene or the protein product of that gene. And so, these smart drugs these are thought to be the future of cancer, but the problem is if you look at a cancer cell, each cell has a different number of mutated genes and throughout that and every different cancer even if I say pancreatic cancer in different individuals has a different cohort of mutated growth accelerating and growth. Ron are you still here?

Dr. Ron Ehrlich: No, I'm still here. I'm mesmerised.

Dr. Ian Billingshurst: Okay, so, we've got this cohort of genes that are different for every individual cancer and so we have an impossibly large number of genes and their protein products to attack and not only that. These are not the initiating causes of cancer. What we now know is that cancer originates, and this is exciting stuff because on the basis of true knowledge of what actually causes cancer we have an opportunity to defeat it. We know now that we are not defeating cancer and we can go through with statistics. Sure, we win a few small skirmishes and people appear to get better but mostly it relapses and comes back or they live a terrible life based on the problems that the treatment is caused. But we are not winning this war against cancer. So, what is the truth? Well, the truth was actually discovered by a fellow, a professor Otto Warburg and he was a Nobel laureate scientist. He was a German and he discovered way back in 1920's - 1930's and by the way, he discovered, and all his team discovered much of the basic biochemistry we now understand today. But he found out that the whole problem is an energy problem and what happens is that we have in every tissue in our body we have stem cells and they are the cells that reproduce and provide the new cells for the tissues as tissues to ourselves we're out. But if those stem cells are attacked

by carcinogens there is a very vulnerable genome within those stem cells and that is the genome of the mitochondria.

Now the mitochondria actually originate from bacteria and they're circular and they're lots of them in each mitochondrion and in very active cells there are lots of mitochondria and like the liver and the muscles. But if you have a very acute attack on those mitochondria by carcinogens the cells simply die. But what Warburg discovered was this - If the mitochondria are attacked slowly over a long period of time which is the way most carcinogens work, as they turn off the energy supply produced by the mitochondria which are a very efficient energy supply, it burns fat, that burns sugar basically also protein by way of sugar. But if you turn it up very slowly the cell does not die, it adapts, it turns on this saving fermentation form of producing energy.

Now this is a form that all cells have but in most cells, it's so inefficient it can't support the cell. But if the cell now starts to produce by fermentation and ferment sugar and also sometimes an amino acid called glutamine but mostly sugar. If it manages to produce a similar level of energy it was produced formerly by this more efficient method by the mitochondria which are now pretty well not working very well or not at all. This turns on a genetic program.

Now just to illustrate how important this is if we look at an early embryonic stem cell it also produces its energy by fermentation and we know that when a cell is producing energy by this fermentation method it's sending signals to the nucleus that this is the time to go into reproductive mode and to just turn on every source of reproduction possible. And as it happens in this particular program also in the cancer cells turns off two very important tumour growth suppressor genes as the p53 and the retinoblastoma. When that happens, what's happening now is that a mutation start to accumulate, and this is the origin of the mutations.

But the problem begins in the mitochondria, not in the genome. The carcinogens attack. Why do they attack the genome of the mitochondria? Because it's bacterial in origin. This was a long-ago parasite and it's not well protected and it's out there. This genome is being attacked by the carcinogens, this is turning off the very efficient and that's called oxidative phosphorylation way of producing energy by the mitochondria. We have this resurrection in this tissue stem cell of this. It's called glycolysis but it's a fermentation process. That's the signal reminder to this nucleus to begin the process of reproduction. This will begin with cancer and because those retinoblastoma and p53 are actually bypassed or turned off, we now get an accumulation of mutations to those growth-controlling genes because these are the ones that are now exposed and these are the ones that are being used and every time they're being used to reproduce they are open to changes but because the retinoblastoma and p53 is turned off there is no repair of mutations and now the mutations drive it.

This is what we are currently looking at. We're looking at the mutations and the protein products of those mutations and attempting to defeat cancer that way. But there's a much simpler, more logical, more humane, more beneficial way and that is to attack the cell, the cancerous cell through nutrition and those cancer cells because they don't have mitochondria



and the only ferment can only use sugar. If we limit the sugar and give the body of food that cancer can't use, we can effectively starve cancer and of course, that food is ketones.

Dr. Ron Ehrlich: We're going to get on to that but that philosophical difference, that interposing of that one step... Well, it's not one but one idea that it's an energy problem not a mutation of the cancer cell problem has huge implications for how we approach it because of course, you mentioned chemotherapy, you mentioned radiation and of course that's kind of like throwing a hand grenade into the thing, it just kind of explodes and kills and there's a lot of collateral damages in there, isn't it?

Dr. Ian Billingshurst: Absolutely. We're destroying the immunity, we're destroying not only the cells involved but with other cells throughout the body. We're weakening the patients and it's not surprising and we're using things that are actually also carcinogenic both chemotherapy and radiotherapy. We're using things that cause cancer to attempt to treat cancer and it's a futile way of doing. Unfortunately, even the smart drugs are not working.

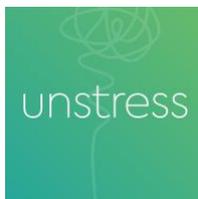
Dr. Ron Ehrlich: Yeah, and fundamentally the beauty and this is what I also know you find it very exciting, I do too. The beauty of this is that what we're doing is taking a step back and saying "Hey, there's a difference between the way a human healthy cell produces energy and there's a difference between the ways a cancer cell produces energy." Let's target that.

Dr. Ian Billingshurst: Absolutely and that's what we need to target because even if you forget about the background to all of this which is absolutely fascinating and totally validates this approach. Even if you just understand very simply that the cancer cell cannot produce energy in the way a normal cell does and therefore this is its Achilles heel. That's all you need to know. It validates a lot of research we are doing by the way. It's wonderful research and it's produced thousands of paper, probably tens-hundreds of thousands of papers just produced biotech companies and has produced lots of research scientists but it hasn't done a great deal if anything to the cancer patient.

Dr. Ron Ehrlich: Yeah, which begs the question, well, this is not new information although a lot of new information has built more structured to the theory but it's not happening out there. Acceptance of new ideas doesn't happen very quickly, does it?

Dr. Ian Billingshurst: No, it doesn't. In this case there is an enormous impediment it's called money and we have a pharmaceutical industry that absolutely thrives and is continuing to thrive and to grow on a lovely and steady supply of cancer patients and we're certainly getting that the cancer problem is growing and our inability to treat it is equal to the task. Continuously unable to treat it, and for this, in fact, continues to drive the cancer industry.

The really sad thing is that the bulk of our physicians whether they be and oncologists, whether they be veterinary or medical are trained while these pharmaceutical companies, we have the same thing with vets who are trained in nutrition by the pet food companies but our oncologists are trained by the very companies that are going to profit from the sale and use of their products.



Dr. Ron Ehrlich: Yeah, this is like history repeating itself. There you were as a student being taught by the agri-scientist who worked for the processed food industry teaching you in “nutrition” and here the oncologists are being encouraged to in get themselves involved in research grants and everything to find the greatest breakthrough drug in oncology to find that magic bullet.

Dr. Ian Billingshurst: That's exactly right and you can't make money out of nutrition, so they're not interested.

Dr. Ron Ehrlich: Well, let's talk about that. Well, not about the making money but let's talk about the nutrition because this kind of approach does give great hope, empowers individuals to take control a lot more. Let's talk about firstly the role that the Western diet, sugar has had on this incidence of cancer.

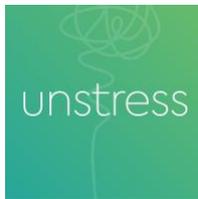
Dr. Ian Billingshurst: Yes. That's a hot subject in itself but it boils down I think mostly to two words sugar and insulin. If we look at high sugar, what does it do? Well, it promotes inflammation. That's a known fact. Secondly, it promotes a process called glycation which is a non-enzymatic, non-biological combining of sugar with important molecules in the body which are proteins and lipids and also with DNA the dynamic material.

Sugar is very destructive just on those terms but also sugar encourages us to eat more sugar. The more sugar we eat, the more sugar that we want to eat, and this in itself has an impact in the mitochondria by driving up the production of what are known as reactive oxygen species which further damage the mitochondria and other important molecules as a result. Our love affair with sugar is so dangerous.

On the other side of the coin, we have insulin as our bodies are eating more sugar the role of insulin which comes out in response to the high sugar that we put in is driving the accumulation of fat in our body. As that happens our bodies become more resistant to the effects of the insulin. There was an evolutionary reason for this and most people actually got it wrong. Clearly, over evolutionary time the reason for insulin resistance is so we didn't get too fat. If the body, those fat cells become insulin resistant they can't absorb as much sugar, but the trouble is then that the sugar and back in ancient times this only occurred periodically in particular seasons. The individual wouldn't get too fat, who are probably also having periods of starvation at odd times and the insulin resistance just kept their body at a certain level. But today we just eat sugar every day and back then there were periods when sugar was not abundant when fat and animals were more abundant and so on.

This is where fasting and all that sort of stuff come in, I'm really shortcutting a few things. Sugar encourages obesity but only to a limited extent. But when we have sugar at every meal three times a day as people do in the Western diet with their cats, dogs or humans then we do accumulate it, we get this insulin resistance.

Now with insulin resistance the level of insulin that is put out by the pancreas rises, rises and rises. What does insulin do, it promotes inflammation as well and it also promotes insulin-like growth factor and so we have a situation as far as cancer is concerned that insulin is



driving cancer and all of its own. The sugar is driving cancer by reactive oxygen species and also because it promotes inflammation.

We have sugar and insulin promoting inflammation which drives cancer. I'm horrified as I watch my own profession recommend that dogs eat this way and of course if you talk to any nutritionist that's being trained, the whole nutrition and this worries me, the whole nutrition profession actually started off with I think with Kellogg's and if you talk to a lot of nutritionists today they will not tell you that sugar is harmful the way it actually is and this is a real problem. Anyway, that's the story with sugar. We have to become fat burners, not sugar burners. That's the clue.

Dr. Ron Ehrlich: Yeah, look it's interesting Ian because on this podcast we've done programs on heart disease. I've spoken to Ross Walker cardiologist and then we spoke to Dr. Terry Wahls, the autoimmune MS person and talked about cancer, talk about diabetes, it's always coming down to the lower the insulin level, the healthier the individual will be.

Dr. Ian Billingshurst: Absolutely.

Dr. Ron Ehrlich: For you, as a vet, because there's much to be learned from ancestral diets and I suppose if I'm not wrong dogs are carnivores, aren't they?

Dr. Ian Billingshurst: Well, actually they're what's called facultative carnivores. When I do my lectures I put up a slide and it's called the herbivore carnivore continuum because a lot of people want to just say all dogs are carnivores and they're getting a little bit mixed up between taxonomic classification and nutritional classification and on this herbivore carnivore continuum at the left end if you're looking at it face on, we have all the herbivores cattle and sheep and deer and so on. At the far right, we have obligate carnivores which is big cats or little cats. They are obligate carnivores, they have to eat an animal-based diet. It must be at least seventy percent of the diet for true health. Squarely in the middle, we find genuine omnivores and things like pigs, humans and chickens, or chooks as we say in Australia.

To the left of the humans, the pigs and the chickens we find animals like rodents. Sort of stuck somewhere between humans and the herbivores and they tend to be a little bit of a grainavore actually and the sad thing is we do a lot of our research with those and we make some wrong assumptions. Some of the assumptions are right, some wrong.

Now if we go back to the middle again on this continuum with humans' pigs and chickens and roughly in the centre. If we move to the right, we come across the dog. If we move a little bit further to the right, we come across the wolf and then, of course, extreme right we come across the cat. Of course, within a population of say wolves or dogs, whatever, there is a small continuum as well as the old bell curve where some individuals within a dog population might be a little bit more omnivorous, other individuals might be a bit more carnivores. But basically, I call dogs carnivorous omnivores and wolves are slightly more and our dogs of course, together with being candid responders were also scavengers and that makes a big impact because that's the way they've developed.

In the sense, yes, they are carnivores, they prefer a lot of meat, but they can eat vegetables and the vegetable material does have benefits. Even the cat gets to benefit from vegetable materials because the cat has eaten other animals for probably thirty million years going back to its oldest ancestors has eaten whole animals including the gut contents. Not always but quite a bit. When I prescribe food for a cat I do include a small amount of vegetable material and do that simply on the basis that if we feed the evolutionary diet or the genome appropriate diet for any animal we have to be feeding. It's a complete and balanced diet in a biological sense, not in just the legal sense that we currently do particularly with our cats and dogs where it is with new food is prescribed for them by these pet companies.

Dr. Ron Ehrlich: How does that stack up? When you buy your processed food for your dog you're saying it's a carnivorous omnivore but that would suggest that 50% of the natural diet or more I'm guessing for dogs would be... I can't imagine dogs out in the wild chomping on too many vegetables and fruits, but I guess if they didn't have a choice. What kind of percentage of protein and carbohydrate are we seeing in processed food for dogs?

Dr. Ian Billingshurst: Well, this is where I say affect the carbohydrate content is over 50%. Actually, the sugar content is over 50% or around about 50% and then there is some fibre and a lot of it's not very valuable fibre because it comes from grains in digest, well, its indigestible and leaving the bacteria in the large bowel don't attack it readily. It just goes out as large volume and I suppose it takes some water with it helping to dehydrate the dog and some minerals and so on. But, yeah, this is not dynamic in any sense of the word. Modern pet foods particularly the dry foods the most common foods for its dogs because they're easy. People can store them without a great deal of trouble and they contain mostly sugar.

Dr. Ron Ehrlich: Are you seeing cancer in dogs?

Dr. Ian Billingshurst: Absolutely. In fact, the dog now is regarded as the most pranced cancer prone animal on this earth and the food that we feed is just terrible. There are no protective nutrients. The protein source is dead animals, cooked up in a huge vat and there is fat in this as well where the delicate fats are destroyed and become toxic but the protein is cooked and cooked and cooked and then it's turned into a meal and that's added to dog food and sold to the pet food companies as a source of proteins and in itself it becomes toxic particularly when that is then recooked combined with sugary starchy stuff. This is appalling.

Dr. Ron Ehrlich: When we look at animals in the wild, do we see cancer in animals in the world?

Dr. Ian Billingshurst: Very rarely, absolutely. Now you could argue this is because they don't live that long and they don't in general but there is no question that the appearance of cancer is very rare in the wild. But as with all degenerative disease and that includes obesity which is the mother of many problems. We do not see these problems in the wild.

Dr. Ron Ehrlich: Let's go back to the ketogenic because we got a bit distracted there and we were talking about sugar and insulin and its effects. The glycation, the insulin resistance, the inflammation, the growth factors. Let's talk about the ketogenic diet. What is it? How does it work?

Dr. Ian Billingshurst: Well, the ketogenic diet. A lot of people are afraid of the ketogenic diet because they are aware of ketoacidosis which is a pathological condition seen in uncontrolled diabetes where there's no insulin in the body. That is a pathological condition and the only way you could ever get close to it under natural conditions is in extreme, extreme, extreme starvation and that's at the point where the person is about to die anyway or the animal or whatever. It's rare but under normal conditions as mammalian species and I'll just concentrate on dogs, cats and humans. Humans spent much of our time, not all of it but a lot of our time in ketosis and why is that so? Now, what are ketones? Ketones are small molecules produced by the liver from fat and we produced mammals, healthy normal mammals will produce ketones under conditions of fasting. Three or four or five days without food they will produce it under they also produce ketones with extreme exercise and perhaps a little bit of fasting thrown in. But also, we have a ketogenic diet. The ketogenic diet will produce ketones. What's a ketogenic diet? It's a diet high in fat, it's moderate protein or low protein and as low as possible in carbohydrates. If you think about how we evolved, we spend a lot of our time not eating because we didn't catch prey or couldn't find food, so we would go into ketosis.

What we did, we preferentially cracked open the skull, ate the brain, we would crack open the bones and eat the marrow and any fat that was around the intestines we really went for and so we would be eating a fat and protein diet. This sort of diet would produce ketosis or ketones in our body. Now, what's the value of that? Today because we are not fat, and you become a fat burner but most of the cells in the body can use the fat for energy because we only use fat or sugar as it turns out but the fat can't past the blood-brain barrier and down to the brain. But that problem is solved by the liver whose mitochondria take fatty acids and turn them into ketones and the ketones cross the blood-brain barrier and feed the brain.

The ketogenic diet is able to replace sugar. In fact, what we really need to understand is that it's quite normal for humans to be and cats and dogs when they're eating a genomically appropriate diet and living a lifestyle that they live for millions of years have intermittent fasting for them to be in ketosis. There's a new term coming up now of being metabolically flexible.

Now we are currently as cats, dogs and humans feeling metabolically inflexible because we don't fast, and we have a diet that pushes sugar burning rather than fat burning. But we need to think about ketosis as normal and healthy. In fact, it is more than healthy because we're now looking at ketosis as something that is actually protective and even curative of neurological diseases and other problems.

Dr. Ron Ehrlich: Yes. This is the therapeutic value of it and we'll get onto that in a second but the thing I find most interesting is we've become in the last 5-10-15 years very focused on ancestral diet and Paleo has become very popular and I think for good reason. Even when you go back and look at Weston A. Price and you look at traditional diet but this word of scarcity and prolonged fasting as an integral part of our ancestral experience to me is one of the big stories that I think we all need to get our heads around.

Dr. Ian Billingshurst: I think it was long known as a species and going back into history, this fasting has therapeutic benefits. We are now beginning to understand why. I'll come up with three words. One is a word called autophagy. One is detoxification and the other one is



ketosis. Those three things. Some of those things particularly autophagy people haven't heard of.

Dr. Ron Ehrlich: But go on, tell us a little bit about autophagy. Don't just throw a word in there.

Dr. Ian Billingshurst: Autophagy is eating self. That's what it means. Anyway, Autophagy. Now in phagocytosis, cells eat other things. That's what it just means self-eating. Autophagy, autophagocytosis it kicks in after about three days of a fast and what it does is the body says "Okay, I'm now not getting any nutrients in. I'm going to walk around the body and look at anything that's either malfunctioning or old and they should be cleaned out and I'm going to destroy it". This could be old cells, it could be organelles within cells and that could include mitochondria. It says, "Well, mate you're not working too good". It puts us into this membrane-bound packet. But it then combines it with an enzyme-rich component within the cell called a lysosome and it's completely digested. All the amino acids from that are then recycled. It's taking old stuff and recycling it and recycling it and is producing new stem cells. It's a rejuvenating and it's growing new cells in the body. It's virtually anti-aging.

We know this is going on now. This is an exciting part of where we are today. This is one of the major benefits of a fast beyond about three days, a genuine fast.

Dr. Ron Ehrlich: So, that's autophagy. And detoxification, of course, is part of that process?

Dr. Ian Billingshurst: It is and now finding that the high-fat diet of ketosis is very much assisting with that detoxification processes. It's allowing a lot of that stuff to go out into the bowels and then to be eliminated that way.

Dr. Ron Ehrlich: This ketogenic diet, do you think we can be on it indefinitely? I mean is it a normal state or how should we approach that? Because it's not easy.

Dr. Ian Billingshurst: Okay. As a preventative for aging, degenerative disease and cancer, it's a thing we should do intermittently, almost certainly. There is some evidence that people who stay on it period don't do as well. If you think about it in evolutionary terms the reason is that we're not designed to stay on it full-time. But if you have a cancer patient then you really do have to put them use that and that's being used, and the place called Ketopet Sanctuary together with hyperbaric oxygen to great value in pets. These people are doing some research on pets, principally dogs because they knew they couldn't get human models for this to prove the value of ketosis as a therapy and an effective therapy and a humane therapy for cancer.

Dr. Ron Ehrlich: We're getting good results with these dog studies?

Dr. Ian Billingshurst: Absolutely, brilliant results. Humans are doing this anecdotally around the world and they're getting fantastic results as well. We need to look at this but in terms of do, we stay on it forever? We stay on it as long as we need to. For a cancer patient, I believe this has to be done in a cancer clinic. That's one of the reasons I wrote the book because yes, it is happening anecdotally around the world but it's happening in such large numbers that this is becoming epidemiological. But we have two professions a medical and veterinary

profession who only want to accept the science of something. I could see that people like Thomas Seyfried, Domenic Agostino those people they presented either very scientifically or very superficially. I thought we need to get this science out that explains this so that the layman who has no training in science can understand it. That was my passion to write “Give a dog a bone”. To present the science behind all this. That's the origins right there. But getting back to your question I hope we don't stay in a long-term, but we do dip in and out of it and follow evolutionary norms. If you are a cancer patient we need you to stay in it longer.

Dr. Ron Ehrlich: No, no, I totally agree. There's so much more to talk about. What are the two if you had two most important things to pass on to a cancer sufferer, what would they be? I think you've covered them but let's just put them together in a little bit of a nutshell.

Dr. Ian Billingshurst: Cut the carbs.

Dr. Ron Ehrlich: Cut the carbs. What does that mean to you? This is one of the things because a lot of people think low-carb is a figure that other people don't. What does low-carb mean to you?

Dr. Ian Billingshurst: It means light sugar, it means low insulin. That's the main thing. The two things, the two dietary interventions that are most important are calorie restriction and reduction in carbs and basically going into ketosis and we don't necessarily have to cut the calories by making each meal visibly small, but we can. But properly as well to do it by intermittent fasting. It's an overall cutting the calories.

One example of that is what people who follow the 5:2 diet where they fast two days a week. The other time they just inverted commas normally whatever that means but they are cutting their overall calorie intake. This is reducing obesity. They're becoming fat burners much of the time, not all the time but much of the time. Basically, we have to get back to an evolutionary programming nutrition. Forget about Palaeolithic, forget about the Mediterranean. What are our bodies designed to eat? That is the question. That is the question because that's imprinted in our genome and we now have a new science or probably we knew about it from the poise. That's called epigenetics where the way our genes respond to diet is enormously plastic and we can give a bad diet and I'll respond in one way so biologically inappropriate diet or a biologically appropriate diet and they're going to respond with health.

If we want to live a long time, there is some science that tells us that a calorie-restricted diet is the only proven method of extending life scientifically.

Dr. Ron Ehrlich: Now listen, I just want to finish with one final question and this is kind of taking a step back from your role as a vet and also as an author. We're all consumers and we're all on this journey through life. What do you think the greatest challenge is to people on their health journey through life in our modern world today? What do you think the greatest challenge is?

Dr. Ian Billingshurst: The greatest challenge is misinformation. Where do you get the right information? I've always felt that people say to me “You must hate processed pet food or you must hate this or that” and I say “Well, I don't hate anything really. What I hate is untruth”.



Truth is power. What is the truth? Well, now that becomes difficult. But if we know the way things actually work, if we really know how they work then that's very powerful and, on that basis, we should be able to make a choice. Some people might say "Well, okay, I'm going to choose to eat what you call badly because I will love to eat badly and if I have a short life and if the end is pretty awful I'll accept that". Now at the end, they probably don't but that can be a choice. But it's a choice made on information.

This is what I always try to give people. Information on which they can base a valid choice. Our biggest problem is invalid information. Of course, we have an internet now and it's very difficult to define what is true and what is false. A lot of the science that we look at is simply based on a company trying to push a particular idea because they push down on and inhibit or won't validate any size that actually shows the truth if it is antagonistic to their products. You've got to look at vested interest.

I'm hoping that what I'm presenting is true and a lot of the science we're learning now is true because it seems to have the ring of truth and it seems to be doing good, but we just got to keep learning more. The biggest impediment is a lack of knowledge, not knowing the truth.

Dr. Ron Ehrlich: Ian thank you on that note. A perfect time to say thank you for joining me today. It's been fabulous talking to you. We're going to have links to your books and the latest book "Pointing the bone at cancer". Thank you very much.

Dr. Ian Billingshurst: Thank you for having me. It's been a real pleasure talking to you.

Dr. Ron Ehrlich: Isn't it interesting to hear about the influence of the USDA - The United States Department of Agriculture on everyone's health? Animals and humans alike. Now the USDA's primary role is to promote agricultural products and for the last 40 or 50 years that's been largely focused on grains – wheat, corn, soy. They had a significant influence on the food pyramid which has been the foundation in one form or another for almost all of that advice for humans and animals alike and our health problems avoidable. Preventable health problems seemed to suggest that that focus grains and carbs and the demonisation of fats and cholesterol has not been a particularly good thing.

Now if you've been following the podcast you'll have realised that irrespective of which disease we are talking about, the lower the insulin and the lower the carbohydrates, the better and importantly incorporating healthy fats into your diet and not demonising cholesterol are all an important part of a healthy message.

Does that mean that government policies change? Well, if you go on to the USDA site Dietary Reference Intakes - DRI's calculator for health professionals. This is an online a tool to help health professionals to and I quote "calculate daily nutrient recommendations based on the Dietary Reference Intakes established by the health and medicine division of the National Academies of science engineering and medicine. The data represent the most current scientific knowledge on nutrient needs." We're talking 2018 here. You can go on and read that. Basically, it's the food pyramid when you add in your weight and your height and your activity levels and then it spits out a recommendation for you, it's basically the food pyramid with lots of carbs and keep those fats as low as possible and by all means, avoid



cholesterol. That's the up to date supposed government recommendations. Hardly the most scientific or current scientific knowledge on nutrient needs and that's the USDA's site where you can put your own details in.

Give it a go. It's interesting, it's what actually this podcast is about, and I also think we have a lot to learn from history. Ian used terms like evolutionary diet, genomically or genetically appropriate diets. That's that word again “appropriate” and metabolically flexible diets.

It was also interesting to hear Ian put animals onto herbivore-carnivore continuum. I think this is actually really important. We have through human history had a relationship with animals as a source of food. I understand. I understand there are ethical issues surrounding factory farmed animals and their health issues that accompany them. That's not just for the animals but for us and the planet. I'm not a fan of factory farming. I think it's cruel for everybody involved but we could look at human history and see cultures that have sat on that continuum and sit on that continuum even today. Generation after generation they sit on a different spot on that continuum.

The part that worries me a little and I'd love to get your feedback on this is veganism. Do you know of a human culture that has survived and thrived for hundreds or for that matter thousands of years on a vegan diet? If you do please drop us a line and let me know. I'll leave that question with you and perhaps we might explore that in a future podcast.

We'll have links to Ian's website where he's got some great resources, some great books and a DVD. Until next time, this is Dr. Ron Ehrlich. Be well.

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