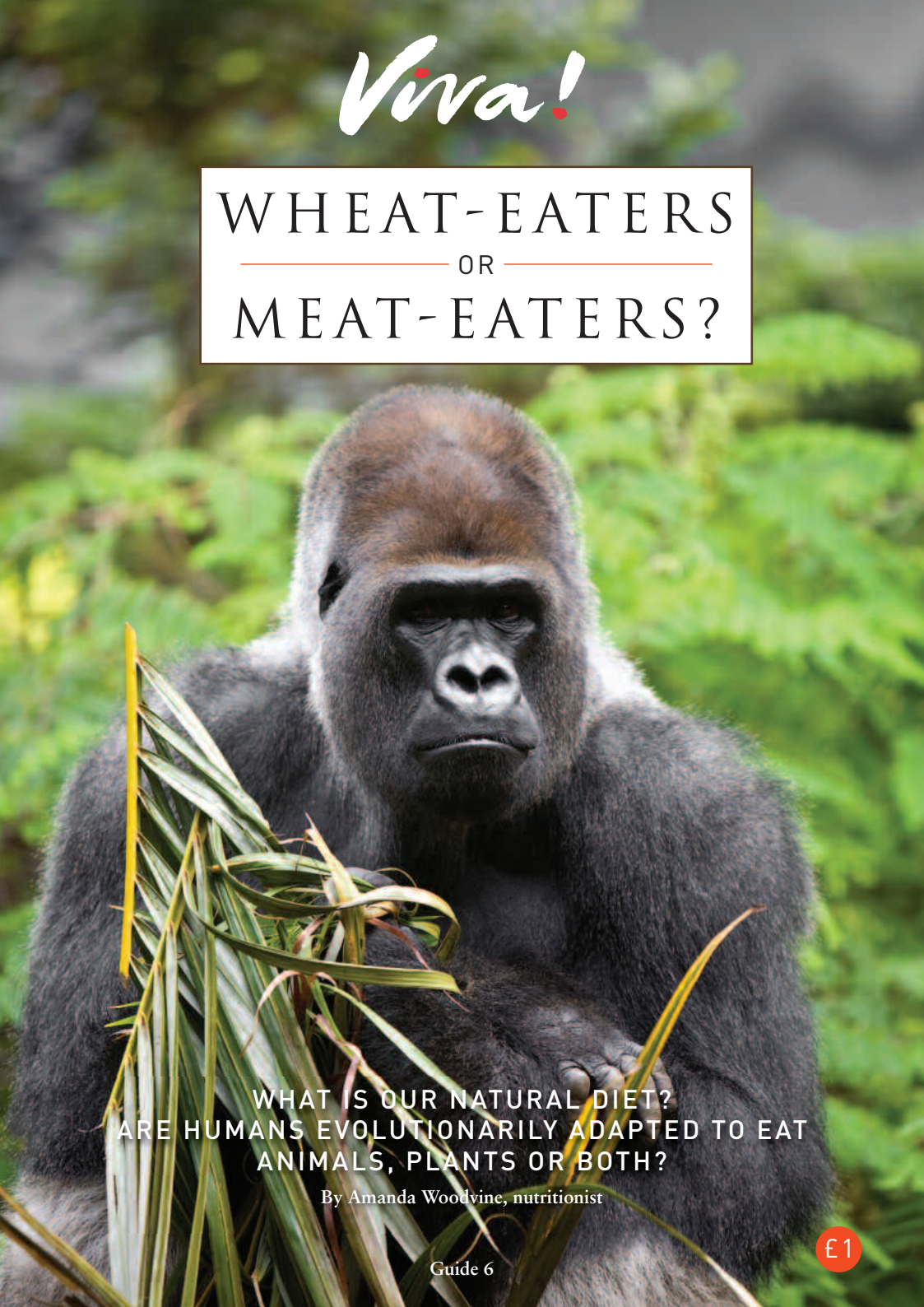
Viva!

WHEAT-EATERS OR MEAT-EATERS?



WHAT IS OUR NATURAL DIET?
ARE HUMANS EVOLUTIONARILY ADAPTED TO EAT ANIMALS, PLANTS OR BOTH?

By Amanda Woodvine, nutritionist

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Guide 6

WHEAT-EATERS OR MEAT-EATERS?

BY AMANDA WOODVINE, BSC NUTRITION
(WITH ADDITIONS BY COLIN SPENCER)

INTRODUCTION

One of the most pervasive myths surrounding vegetarianism is the belief that humans are naturally meant to eat meat – that we are evolutionarily adapted to eat and thrive on dead flesh. The evidence presented in this guide knocks this myth firmly on its head. Human beings belong to the primate family and the primate family is essentially a vegetarian one. Our closest living relatives such as chimpanzees and gorillas live on a diet of foods overwhelmingly derived from plants, and we ignore our evolutionary past at our peril. Indeed we are already seeing the dangers of dismissing what evolutionary studies show us we should be eating – plants, not animals – with the growing epidemics of killer diseases such as cancer, heart disease, obesity and diabetes which are now occurring in almost every corner of the planet.

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CUES FROM THE BODY: WE'RE WHEAT-EATERS, NOT MEAT-EATERS

Basic anatomical comparisons show that people have much more in common with herbivores than carnivores – or even omnivores! Just a look at an adult's mouth – let alone a child's – shows that the opening is too small for anything but relatively small pieces of food. We can't even swallow those whole, but must chew them finely and mix them with saliva before the ball of food will slide down the oesophagus. If too large a piece is swallowed, it can lodge over the windpipe and prevent the air from getting to our lungs.

Because we are so poorly equipped to chew and swallow meat, choking is common in populations that eat a typical Western diet. Thousands die each year from choking on food, usually meat products. In contrast, carnivorous animals such as cats seem not to have to chew their food, but tear off chunks and swallow them almost immediately.

It is sometimes suggested that the existence of canine teeth in humans proves that we are adapted to eat meat. However, our teeth are much better suited for eating starches, fruits and vegetables – not tearing and chewing flesh. What many refer to as our 'canine teeth' are nothing at all like the sharp blades of true carnivores designed for processing meat.

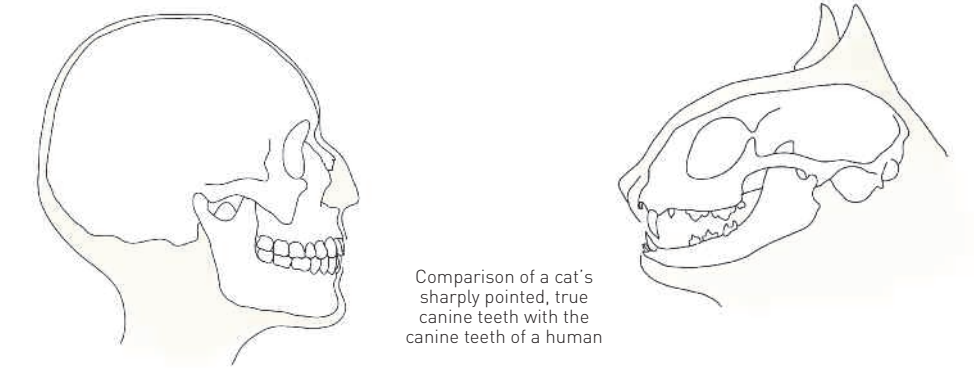
Scientists have been saying for decades that we are an herbivorous species. For example, Dr W. S. Collens, research scientist at the Maimonides Hospital in Brooklyn, USA said: "Examination of the dental structure of the modern man reveals that he possesses all of the features of a strictly herbivorous animal" (Collens and Dobkin, 1965).

Such features include jaws that can open and close as well as move forwards, backwards and side-to-side. This is ideal for biting off pieces of plant matter and then grinding them down with our flat molars.

In contrast, carnivores' lower jaws have very limited side-to-side motion. They are fixed only to open and close, which adds strength and stability to their powerful bite.

HUMANS – DESIGNED TO BE VEGAN

Some people still mistakenly believe that humans are born to be meat-eaters. The fallacy of the 'meant to eat meat' myth is easy to see when the characteristics of naturally vegetarian animals and naturally carnivorous ones are viewed side-by-side, as outlined in the table on the next page.



Comparison of a cat's sharply pointed, true canine teeth with the canine teeth of a human

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COMPARATIVE ANATOMY CHART: CARNIVORES, HERBIVORES, OMNIVORES AND HUMANS

CARNIVORE	HERBIVORE	OMNIVORE	HUMAN
Facial muscles			
Reduced to allow wide mouth gape	Well developed	Reduced	Well developed
Jaw type			
Angle not expanded	Expanded angle	Angle not expanded	Expanded angle
Jaw joint location			
On the same plane as the molars	Above the plane of the molar teeth	On the same plane as the molars	Above the plane of the molar teeth
Jaw motion			
Shearing; minimal side-to-side motion	No shear; good side-to-side, front-to-back motion	Shearing; minimal side-to-side motion	No shear; good side-to-side, front-to-back motion
Mouth opening vs head size			
Large	Small	Large	Small
Teeth: incisors			
Short and pointed	Broad, flattened and spade shaped	Short and pointed	Broad, flattened and spade shaped
Teeth: canines			
Long, sharp and curved	Dull and short or long (for defence), or none	Long, sharp and curved	Short and blunted
Teeth: molars			
Sharp, jagged and blade shaped	Flattened to grind food	Sharp blades and/or flattened	Flattened to grind food
Chewing			
None; swallows food whole	Extensive chewing necessary	Swallows food whole and/or simple crushing	Extensive chewing necessary
Saliva			
Acid saliva; no enzyme amylase to pre-digest grains	Alkaline saliva; much amylase to pre-digest grains	No digestive enzymes	Alkaline saliva; much amylase to pre-digest grains
Small salivary glands in the mouth (not needed to pre-digest grains and fruits)	Well developed salivary glands, needed to pre-digest grains and fruits	Small salivary glands in the mouth (not needed to pre-digest grains and fruits)	Well developed salivary glands, needed to pre-digest grains and fruits
Stomach type			
Simple	Simple or multiple chambers	Simple	Simple
Stomach acidity			
Much strong hydrochloric acid in stomach to digest tough animal muscle, bone etc. pH less than or equal to 1 with food in stomach	Stomach acid 10 times less strong than carnivores. pH 4 to 5 with food in stomach	pH less than or equal to 1 with food in stomach	Stomach acid 10 times less strong than carnivores. pH 4 to 5 with food in stomach
Stomach capacity			
60% to 70% of total volume of digestive tract	Less than 30% of total volume of digestive tract	60% to 70% of total volume of digestive tract	21% to 27% of total volume of digestive tract
Length of small intestine			
Only 3 to 6 times body length so rapidly decaying meat can pass out of the body quickly	10 or more than 12 times body length; fruits do not decay as rapidly so can pass more slowly through body. Also allows more time for the break down and absorption of nutrients from plant foods	4 to 6 times body length	10 to 12 times body length
Colon			
Simple, short and smooth	Long, complex; may be sacculated	Simple, short and smooth	Long, sacculated
Liver			
Can detoxify vitamin A	Cannot detoxify vitamin A	Can detoxify vitamin A	Cannot detoxify vitamin A
Kidney			
Extremely concentrated urine	Moderately concentrated urine	Extremely concentrated urine	Moderately concentrated urine
Nails			
Claws as appendages	Hands/hooves as appendages. No claws	Claws as appendages	Hands as appendages. No claws
Body cooling system			
Hyperventilation (via the mouth)	Perspires to cool body through millions of skin pores	Hyperventilation (via the mouth)	Perspires to cool body through millions of skin pores

Adapted from Store, 2008 and Mills, M.R. MD, 2009

A TRIP THROUGH THE BODY

On the tips of our tongues are sensors, designed to seek out sweet-tasting foods – carbohydrates (sugars). While plant foods are full of carbohydrates, there are essentially none in meats of any kind (except for a small amount of glycogen). Carnivores' tongues have no carbohydrate sensors – they have no need for them. Instead, carnivores' taste buds are pleasantly stimulated by animal proteins (amino acids) (Li *et al*., 2005).

From top to bottom, human digestive systems have evolved to efficiently process plant foods. Digestion begins in the mouth with a salivary enzyme called amylase (ptyalin). Its sole purpose is to help break down complex carbohydrates from plant foods into simple sugars. As there are no carbohydrates in meat, true carnivores don't need this enzyme. Their salivary glands don't synthesise it.

The stomach juices of meat-eating animals are highly acidic. They have to be, so that they can break down the large quantities of muscle and bone materials they eat.

Much lower concentrations of stomach acid are needed to digest starches, vegetables and fruits. Weight for weight, plant protein requires half the amount of hydrochloric acid to digest it, compared to animal protein. It is also digested in half the time (Lucas, 1979).

Humans and other plant-eaters have much lower levels of stomach acid than carnivores. They are much better equipped for digesting plant foods – and may even increase their risk of stomach ulcers if they do eat meat.

Vegans and vegetarians have fewer peptic ulcers than meat-eaters. This is mainly because their plant-based diets are much easier to digest.

The human intestine is long and coiled, much like that of apes, cows and horses. This makes digestion slow, allowing time to break down and absorb the nutrients from plant foods.

In contrast, the intestine of a carnivore, such as a cat, is short, straight and tubular. This means that flesh can be digested very rapidly, and the remnants excreted quickly, before they putrefy (rot). Overall, the intestines of meat-eaters are noticeably simpler than those of plant-eaters like people.

The difference in transit time (time taken for food to make its way from the mouth to the anus) between humans and carnivores is what really brings the anatomical differences home. Humans – even those on a high fibre diet – have an average transit time of almost 41 hours. In stark contrast, the average transit time in a pure carnivore such as the mink, is just 2.4 hours (Milton, 1999)! This means that when people eat meat, it has plenty of time to putrefy (rot) and cause the production of cancer-causing agents.

THE EXTERNAL CUES

Finally, take a look at the external differences. Our hands are made for gathering plants, not for ripping flesh. We cool ourselves by sweating, like most other plant-eating animals, rather than panting like carnivores. We drink by sipping, not by lapping like a dog or cat.

The exhaustive comparisons of our body traits with those of other animals prove that we have evolved over aeons in an environment of plant-based foods. We were made to be plant-eaters, not meat-eaters. We are now paying the price for straying from our design with chronic illnesses and premature death.

NUTRITION: BACK TO OUR ROOTS

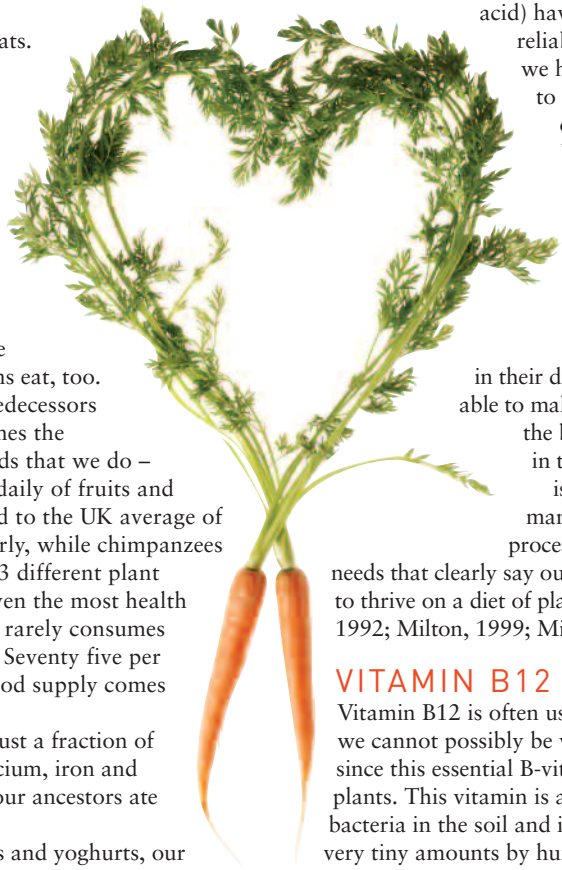
We have eaten plant foods throughout our evolution. This has shaped our current nutritional requirements. Our evolutionary diets would have been high in fibre, vegetable protein, plant sterols and other protective 'phytochemicals', and low in harmful saturated and trans fats.

Fruits, green leafy parts of plants, shoots, seeds, nuts, roots and tubers are the fundamental components of the primate eating pattern – and common sense tells us that these foods should be the foods that humans eat, too.

Our Stone Age predecessors ate three or more times the amount of plant foods that we do – about nine servings daily of fruits and vegetables, compared to the UK average of around three. Similarly, while chimpanzees are known to eat 123 different plant varieties in a year, even the most health conscious Westerner rarely consumes more than 20 or 30. Seventy five per cent of our global food supply comes from just 12 crops.

And we consume just a fraction of the antioxidants, calcium, iron and other nutrients that our ancestors ate every day.

Even without cows and yoghurts, our ancestors also managed to get more calcium than we do, primarily because of the dark green leafy vegetables in their diet. They racked up an impressive 1,900 milligrams (mg) a day, compared with the 1,007 mg that most men – and the 777 mg that most women – consume these days!



OUR BODIES NEED PLANT NUTRIENTS

Vitamins are essential micronutrients that cannot be synthesised by the body and must be obtained in the food we consume. Since plants, rich in vitamin C (ascorbic acid) have always been a reliable part of our diet, we have lost the ability to synthesise (make our own) vitamin C. Without it in our diet, our health suffers dramatically. In contrast, carnivores have never had a reliable source of vitamin C in their diets. They are still able to make their own from the basic raw materials in their meat diet. This is one example of many metabolic processes and nutritional needs that clearly say our bodies are designed to thrive on a diet of plant foods (Carpenter, 1992; Milton, 1999; Milton, 2000).

VITAMIN B12

Vitamin B12 is often used as a reason why we cannot possibly be vegetarian in nature since this essential B-vitamin is not found in plants. This vitamin is actually produced by bacteria in the soil and is required in only very tiny amounts by humans. Eating plant foods with B12-containing soil particles attached would have been commonplace in our evolutionary history.

Of course today we cannot rely on unwashed vegetables providing vitamin B12, which is why it is vital that a daily source of this vitamin is provided by fortified foods such as yeast

extracts, soya products and many breakfast cereals. In fact, we now know that the B12 found in fortified foods is better absorbed by the body than the B12 found in foods such as meat, fish or eggs!

Scientists have being saying for decades that while designed to subsist on vegetarian foods, man has "perverted his dietary habits to accept the food of the carnivore," (Collens and Dobkin, 1965). And this is not without serious consequences for our health.

CHOLESTEROL OVERWHELMS A PLANT-EATER'S LIVER

Cholesterol is a type of lipid (fat) called a sterol. The body does need some cholesterol, but the liver can make all of the cholesterol that the body requires.

It is well known that too much cholesterol is harmful to the human body. What is less widely known is that cholesterol is only found in animal foods, and not plant foods.

Meat-eating animals have an unlimited capacity to process and excrete cholesterol from their bodies. For example, you could feed a cat pure egg yolks all day long, and he or she would excrete all of it, never suffering from a build up of cholesterol. On the other hand, people's (like other plant-eating animals) livers have a very limited capacity for cholesterol removal. Most people have great difficulty eliminating the amounts of cholesterol that they take in from eating animal products.

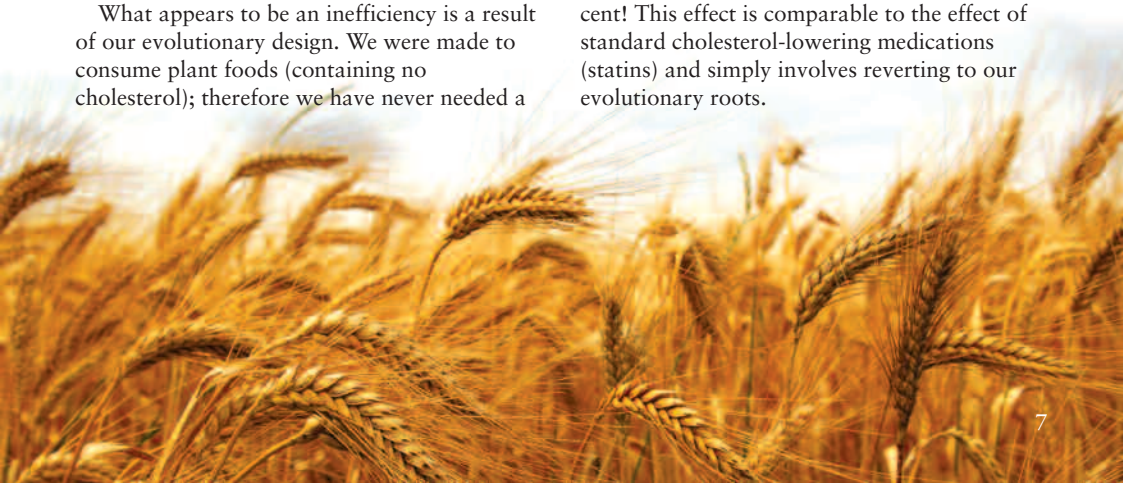
What appears to be an inefficiency is a result of our evolutionary design. We were made to consume plant foods (containing no cholesterol); therefore we have never needed a highly efficient cholesterol-eliminating system. It is also believed that evolution favoured (and therefore conserved) mechanisms in the body which tend to raise blood cholesterol levels (Jenkins *et al*., 2003).

Eating animal products – including meats, fish, eggs and dairy foods – can lead to a build up of cholesterol. This can result in deposits in the arteries (atherosclerosis), in the skin or under the eyes (xanthelasma) and in the tendons. Bile supersaturated with cholesterol forms gallstones. Meat-eaters are twice as likely to be afflicted with gallstones, compared to vegetarians. For further information see the VVF's report, *White Meat Black Mark*.

Cholesterol can't be avoided by choosing lean cuts of meat as it's mainly found in the lean parts. White and red meat and fish all contain cholesterol. One small, grilled, skinless chicken breast contains around 100 milligrams of cholesterol – an amount that can add roughly 0.13 mmol/L (or 5 mg/dL) to your cholesterol level! Worse still, animal products also contain saturated fat which causes our livers to make even more cholesterol.

It is a sad fact that cholesterol-lowering medications are the order of the day for modern, middle aged humans – a consequence of our Westernised diet and lifestyle.

But scientists have managed to lower people's cholesterol levels by simply changing their diets. By eating more fibre, vegetable proteins and plant sterols – in the form of leafy vegetables, fruit and nuts – healthy people's cholesterol levels have dropped by over 30 per cent! This effect is comparable to the effect of standard cholesterol-lowering medications (statins) and simply involves reverting to our evolutionary roots.



MEAT-EATING CHIMPS?

It has passed into popular folklore that chimps have been observed eating meat, which has been taken as an indication that humans too have evolved to eat meat. This is in large part due to a David Attenborough film many years ago in which chimps were seen hunting small monkeys and baby bushpigs. Attenborough's observations were first recorded by chimpanzee expert Jane Goodall. Her group of chimpanzees was studied over a period of years so the amount of meat eaten and the number of animals killed could be exactly recorded. Over a span of 10 years, the 50 or so chimpanzees killed and ate 95 mammals. They were all tiny – the young of bushpigs, bushbuck and baboons – and most weighed 10lbs or less. It works out at 2.4 grams per individual per day – about the size of a pea! But even this may be an overestimate caused by observer disturbance in the chimp populations studied. So, meat-eating in chimps is actually incredibly rare – rough estimates are that it forms just 1-1.5 per cent of the overall diet. And, of course, not all chimp groups hunt at all.

Whilst our primate ancestors did eat insects this was not in sufficient quantity to provoke a change in their dentition. Primate canine teeth are small and their molars have a large grinding surface with a thick enamel covering, making their jaws a powerful crushing, grinding and chewing machine designed to cope with vegetation.

Of all the living primates, humans are the only one to eat large animals, the rest being almost entirely herbivorous. We sprang out of this genetic breeding pool of largely peaceful groups of amiable creatures that lived by eating grasses, leaves, nuts, berries, fruits and roots. There can be no doubt that our metabolism, built up through these millions of years, is best sustained by a vegan and then a vegetarian diet, in that order.

OUR INSTINCTS ARE FOR PLANTS

While many people are repelled at the thought of consuming fresh meat (especially something unfamiliar such as kangaroo, rat or cat), most don't react so negatively to any fruits and vegetables – even unfamiliar varieties. Most people would be nowhere as reluctant to try, and to enjoy, unfamiliar fruits for the first time – even something such as a star fruit from the tropics. Natural instincts cause people to be drawn to fruits and vegetables.

Viva! founder Juliet Gellatley suggests that we try the following experiment with a small child. Encourage him or her to cuddle a baby lamb, and then ask if they want to kill or eat it. You won't be popular until you explain!

A televised social experiment in 2000 affirmed that our natural instincts are towards vegetarianism. Thirty-four TV 'guinea pigs' were cast away by the BBC on the island of Taransay. Rather than slaughter the animals provided for their sustenance, several of the castaways became vegetarians. This was despite the fact that one of their number was a butcher, thus sparing the rest of the team the agony of having to slit a gizzard personally!

Writes *Daily Express* journalist, Martin Plimmer: "The Taransay castaways, in a vain attempt to remain authentic and reasoning that it's easier to be cruel to fish, which are cold, wet and unfluffy... decided they would up their protein intake by catching fish. However, in six months the fishing detail, led by... a man who claimed to be a keen angler, hasn't managed to land a single catch. At least, that's what they say, though this seems inconceivable considering Taransay is a roundabout on a fish motorway" (*Daily Express*, 2000).

Plimmer continues: "We are so conditioned to eating over-prepared food that most children and many adults will not eat meat or fish at all unless it arrives in balls or fingers, hidden in a pie, or in the shape of alphabet letters or Kievs..."

GOING BACK IN TIME

Sixty million years ago the lower primates first developed – the mammals from which we all sprang. So much of what makes us skilled as mammals was developed at this time. The change from clawed paw to a hand that grips was invaluable for picking objects up and for using sticks and stones as tools. Our vision became stereoscopic as the eyes moved from the side of the face to the front. These overlapping visual fields produced the ability to see in depth – vital to identify predators from a distance.

A species – in order to survive and rise in dominance – must be flexible, must adapt to changing conditions and take advantage of the unexpected. All living creatures that depend upon a particular environment for their survival are doomed to extinction if that environment is destroyed. The key to success is not only flexibility but also inconsistency, the art of confusing your predators. Lemurs, one of our earliest primate ancestors, stayed in the trees for most of their time and their diet was limited to leaves, nuts, fruits, berries and edible stems. Their habitat has remained more or less similar for 60 million years.

Twenty million years after the lemurs came the anthropoids, the higher primates that now include monkeys, apes and humans – another group of vegetarians. Between five and 25 million years ago this group was diversifying and colonising Africa, Eurasia and the tropical Americas using the land bridges that existed at that time.

They would have moved great distances, from cool to warm, from cold to hot and it is thought that the cooler northern climes helped to develop the anthropoids and led them to eat more bark, the cambium beneath the bark (which is high in protein and carbohydrates) and the leaves of evergreens. They were all vegetarians but the diet was widening with many more food choices – and a richer diversity of nutrition means greater intelligence.

Around 18 million years ago came the hominoids, apes which lack tails and have larger brains and bodies than the monkeys. They evolved in Africa and included one called Proconsul, sometimes referred to as the 'Daddy of us all'. It is thought that we share this ancestor with the gorilla and it, of course, is another famous vegetarian. DNA studies show that we have a close relationship with the gorilla and the chimpanzee and that we split from one common ancestor around five to six million years ago.

Because we have the fossilised jaws to study, we know that these primates were herbivores and ate fruits, nuts, berries and the cambium which grows in the spring beneath the bark as the tree begins to swell. Some of us still eat it today and we call it slippery elm, a popular health food supplement for digestive disorders.

Three-and-a-half million years ago, *Australopithecus afarensis*, nicknamed Lucy, appeared. She was small, strode over the African veldt and through the forest, lived near

water and was also a herbivore. There were many different types of Australopithecines and one was called Robustos. He has been labelled a war-like killer and the source of our aggression. He was in fact also a vegetarian but he used the bones of large mammals as tools to dig up roots and bulbs. It was the discovery of these bones alongside his own that made anthropologists think they had found the first hunter. They were at least a million years out.

MEAT-EATING BEGINNINGS

So when did meat-eating begin? We can roughly date hunting because of the tools needed to kill but before that there were some very basic tools used to cut, scrape and dig. These were found with the remains of *Homo habilis*, who lived between 1.4 and 2.3 million years ago. Anthropologists think it is likely that *Homo habilis* first scavenged his/her meat from the kill of big cats but like so much of what is said on the evolution of humans, this is just speculation.

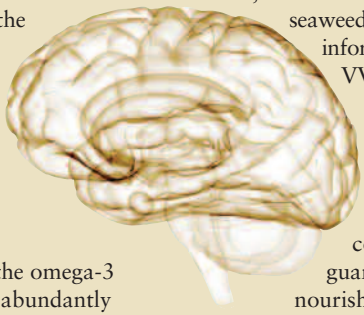
Hunting started around 1.9 million years ago with the advent of *Homo erectus*, who lived until 300,000 years ago. Anthropologists tell us this as if *Homo erectus*, from then on, just ate raw meat and nothing else. In fact, *Homo erectus* could not have survived on meat alone, as large quantities of animal protein unbuffered by fat or carbohydrates are physiologically harmful (Milton, 1987).

There was even a suggestion that our brain development did not begin until red meat entered our diet. If there was a correlation between the consumption of red meat and the enlargement of brain cells, big cats would have the largest brains and be the dominant species in the world today.

BRAIN DEVELOPMENT

For the growth of brain cells, a one-to-one balance of two groups of fatty acids is needed – called omega-3 and omega-6 fatty acids. This balanced combination promotes the growth of the cerebral cortex, the site of intellect and reasoning in the brain.

It is argued by some that the greater intakes of these long chain fatty acids, found in fish and wild game, were a major reason for humankind's extraordinary increase in brainpower. However this ignores three important facts.



Firstly, parent sources of the omega-3 and omega-6 fats are found abundantly in plant foods.

Secondly, the main source of the omega-3 fats in, for instance, fish, is not the fish itself but the food the fish feeds on – green plants such as microalgae. Microalgae contain omega-3 fats called EPA and DHA, whilst seaweed is a source of DHA.

Thirdly, gathering green plants for their fats instead of fish would have been both far easier for our early ancestors and a much more guaranteed and regular source of these fats – plants tend not to run (or swim) away! On the coast, the diet would inevitably have included seaweeds and microalgae. For further information on fatty acids see the VVF's guide, *Fish-free for Life*.

It is the same argument that can be used against meat being the dominant force in the evolution of our bigger brains – meat could never have been a guaranteed, continued source of nourishment due to the problems of securing it.

Killing wild animals is far from easy, and if early humans had relied on meat alone they would have gone without most of the time. The bulk of the diet was what it always had been, gathered from wild plants and some of it, no doubt, dried and stored.

THE REAL FUEL OF BRAIN EXPANSION: COOKING

Brain expansion almost certainly could not have occurred until hominids adopted a diet rich enough in calories and nutrients to meet the associated energy costs. And cooking food does just that. Once plants foods are cooked, they become easier to bite and chew. This means that more energy (calories) can be obtained per minute of eating, and hence more calories can be gained per day. This is particularly true for starchy tubers such as potatoes.

There are nutritional advantages, too. Cooking breaks down the cell walls of vegetables, releasing more vitamins, minerals, protein and carbohydrates. Cooking also makes some poisonous tubers safe, thus widening the range of food available.

Cooking is widely accepted to have occurred at least 250,000 years ago (Ragir, 2000). Other evidence points to the control of fire by hominids even earlier – it is suggested that vegetables were being cooked 1.9 million years ago (Wrangham *et al.*, 1999) as primitive chefs learnt to control and work with fire as a weapon and a tool.

And researchers based at the universities of Minnesota and Harvard in the USA believe that boiling vegetables, such as carrots, poached potatoes and boiled beets was exactly what sparked the development of bigger, human-like brains. This also boosted the availability of food, allowing females to grow almost as big as males.

This contradicts the popular view that eating meat triggered the evolution of hominids into *Homo erectus*, the ancestor of modern man. It is also backed by Chris Stringer of the Natural History Museum in London, who says: "You have equally nutritious food in roots and tubers but these could not be unlocked until they were cooked" (*The Times*, 1999).

Scientists Wrangham and Conklin-Brittain state: "Over evolutionary history the adoption of cooking should probably be regarded as one of the largest ever improvements in dietary quality... enabling humans to maintain a more effective immune system and perhaps contributing to the evolution of reduced mortality" (Wrangham and Conklin-Brittain, 1999).

THE EVOLUTION OF HUMANKIND

AUSTRALOPITHECUS

4.8-1.1 MILLION YEARS AGO
Africa
Early human-like apes, closely related to chimpanzees and gorillas. They varied in height from 3 ft (0.9 m) to nearly 6 ft (1.8 m), had a brain one-third of the size of ours, and walked upright. Vegetarian.

HOMO HABILIS

2.3-1.4 MILLION YEARS AGO
East Africa
Long-armed, largely plant-eaters but also scavenger-hunters, 4-5 ft (1.2-1.5 m) tall, with protruding jaws and brains half the size of ours. They lived in organised social groups, used crude tools and probably communicated with basic speech.

MEAT-EATING: VERY RECENT IN OUR EVOLUTIONARY PAST

Meat-eating began only in the last one-and-a-half million years. Contrasted with the life of an 80-year-old human being it means that only in the last 15 years would meat have been eaten. For 65 years we were vegetarian. This has huge significance for our health today.

Research already shows us that well-balanced plant-based vegetarian and vegan diets supply not only all the nutrients that the body needs but also reduce the risks of many degenerative diseases such as heart disease, some cancers and obesity. Diets based on fresh fruits and vegetables, wholegrain foods such as wholemeal bread, plant protein sources such as beans, along with fresh nuts and seeds are the healthiest of all diets. The reason? It is the diet most similar to the diet of our evolution.

Of course no-one can deny that human beings became omnivorous – in fact, humans colonised the world because they could adapt to the available food sources. However the truth is that very little meat was eaten compared to today's consumption. Hunting was given a great boost when climactic changes destroyed the food sources in the northern climes in the great Ice Ages. However in evolutionary terms this is a very short period and the evidence is that our bodies have not fully adapted to the change.

HUMAN-ANIMAL RELATIONSHIP CHANGE

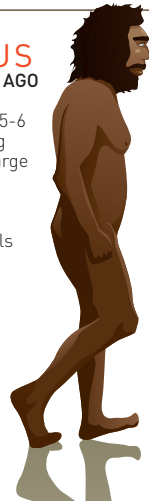
Hunting also helped to change our relationship with animals but the biggest change in that relationship occurred with the move from hunter-gatherer to livestock farmer, from nomadic tribes to settlement and domestication. An even bigger change took place with the introduction of factory farming.

The farmer owns the creature, controls its life and death – he dominates it and here is where speciesism begins. Only when domestication began did *Homo sapiens* begin to believe that they were the dominating mammal, free to exploit every other living creature.

HOMO ERECTUS

1.9 MILLION-300,000 YEARS AGO
Africa, Europe, Asia

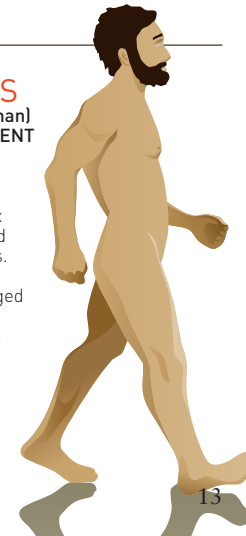
Thick-set, muscular species 5-6 ft (1.5-1.8 m) tall, with sloping forehead, receding jaw and large brain (60-80 per cent of the average today). They had fire, huts, some sort of speech, specialised tools, crude rituals and advanced hunting techniques. Still largely plant-eaters.



HOMO SAPIENS

(Neanderthal man, modern man)
300,000 YEARS AGO TO PRESENT
Worldwide

Large-brained, adaptable species with wide regional differences. They had complex social organisations, advanced speech and tool-making skills. Modern humans (subspecies Homo sapiens sapiens) emerged about 120,000 years ago, and displaced all rivals to colonise the world.



MEAT-EATING AS A SYMBOL OF POWER FOR THE MINORITY

For the greater part of our recorded history, however, meat was the prerogative of the gods and the powerful. From the very beginning meat has meant power. Wealth was measured in head of cattle and wealth meant power and influence in the community. The more meat you ate the more you showed everyone else how well you were doing – it was (and still is in many parts of the world) the gustatory equivalent of the mink coat.

But as far back as 3,500 BC we know that some people scorned meat altogether and the great thinker and mathematician, Pythagoras, was one of them. Indeed the majority of people throughout our history ate meat only on the few religious festival days throughout the year. This would probably have amounted to eating meat no more than three or four times each year compared to three or four times each day that is common for many people today. Thanks to new research even the traditional view of macho carnivorous Roman gladiators has been well and truly laid to rest. Chemical analysis of the bones of gladiators has revealed that they essentially lived on a vegetarian diet of barley and beans for strength – not meat.

Today we no longer have any need to use meat as a symbol of power. The sooner we reject this outdated idea the better – for our own moral and physical health as well as the animals and the planet that pay the price for our desire of meat.

CONCLUSION

Humans are naturally vegetarian and we ignore, at our peril, our vegetarian primate ancestry. One of the world's leading experts on diet and health – Professor T. Colin Campbell – believes that the closer we approach a totally plant food diet, the greater the benefit to our health. Professor Campbell should know a thing or two about this – he's been studying health and nutrition for well over 40 years and has changed his diet to a vegan one based on the findings of his work!

Professor Campbell's thoughts are echoed by William Roberts, one time editor-in-chief of the *American Journal of Cardiology* who states that: "Although we think we are one and we act as if we are one, human beings are not natural carnivores. When we kill animals to eat them, they end up killing us because their flesh, which contains cholesterol and saturated fat was never intended for human beings, who are natural herbivores."

The sooner we ditch the 'meat maketh man' myth the better for our health. We were never meant to eat meat, our bodies are not designed to eat flesh and our health is suffering because of it. Once we exclude animal products from our diets our own health, our planet's health and the lives of billions of animals will be better for it. Only then can we really claim to be an intelligent ape.

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GLOSSARY

THE DIFFERENT TYPES OF DIET

CARNIVORE (OR 'MEAT EATER'):

an animal that gets its energy and nutrients mainly, or exclusively, from animal tissue. Carnivores that depend solely on animal flesh for their nutrients are called obligate carnivores. Although they may eat small amounts of plant material they are unable to digest it efficiently. They may even eat vegetation specifically to help make them vomit (as an emetic). So-called facultative carnivores eat non-animal food as well as animal tissue

HERBIVORE:

an animal that is adapted to eat plants and not meat or fish

OMNIVORE:

an animal that eats both plants and animals as its main food source. They are not specifically adapted to eat and digest either meat or plant material exclusively

VEGAN:

a person who eats no animal products – red and white meats, fish and other water creatures, eggs, dairy and insect products such as honey and cochineal. That means no damaging animal protein, animal fats or cholesterol in their diet. Far from going short, they can – and are more likely to – pack their diet with a wide range of healthy, disease-busting foods high in vegetable protein, fibre, complex carbohydrates, vitamins, minerals and good fats

VEGETARIAN:

a person who avoids eating red and white meats, fish and all other water creatures such as prawns and lobsters; and who also avoids slaughter by-products such as gelatine (made from horns, hooves, bones etc), lard and cochineal (crushed insects). A vegetarian may or may not eat dairy products, free range eggs or honey

PRIMATES

PRIMATE:

a 'rank' (order) of animals that includes humans, lemurs, lorisids, galagos, tarsiers, monkeys and apes (including great apes). These can be divided into so-called 'higher' and 'lower' primates. Higher primates include the Old World monkeys and apes, including humans, and the New World primates

ANTHROPOID:

another word for the higher primates described above, ie monkeys, apes and humans

HOMINOID:

primates can further be divided into 'superfamilies'. The hominoid superfamily includes the lesser apes such as gibbons, and the great apes (hominids). All primates in the hominoid superfamily lack tails and have larger brains and bodies than the monkeys

HOMINID:

hominids (also known as great apes) form a taxonomic family, which includes chimpanzees, bonobos, gorillas, orangutans and humans

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