

# HEMP: OUR LIFELINE TO THE FUTURE

*The widespread  
legalisation of  
cannabis production  
for commercial and  
medical uses would  
have profound  
benefits for our  
economies and our  
health as well as our  
environment.*

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## The Consequences of Hemp Prohibition

It is often said that in war the first casualty is truth. Nowhere is this more accurately seen than in the so-called War on Drugs. Beginning with an hysterical "reefer madness" media campaign by the Hearst press in the early 1930s, the image of cannabis (*Cannabis sativa*) was transformed from a valuable fibre crop and important source of oil and medicine to "a heathen devil weed with its roots in hell". Whether by design or circumstance, the suppression of cannabis paved the way for a dramatic transformation of the world's economy.

Prior to the late 19th century, the world operated on a carbohydrate-based system, where all the fibre, fuel and medicine required to meet human needs was produced by photosynthesis, with the Sun's energy utilised to combine carbon dioxide and water into cellulose, the basic building material of the natural world. During the 20th century, much of this carbohydrate was replaced by hydrocarbons generated by the extractive coal and oil industries. In place of natural hemp fabrics came the petrochemical fabrics. Nylon, polyester and other synthetics were manufactured on a massive scale and promoted by aggressive advertising. In place of the paper bags and boxes came the ubiquitous plastic bags.

Billions of these toxic, non-degradable items have been manufactured only to be used once and then discarded, to find their way into streams and waterways and eventually to coalesce into massive submerged islands of garbage in the Pacific and other oceans, releasing a toxic time bomb of hormone-disrupting chemicals into the marine and human ecosystems. Instead of paper being made from annual fibre crops, vast tracts of ancient forest have been felled and chipped, then cooked with chlorine and other hazardous chemicals to produce an inferior product when compared to what it replaced.

The destruction and contamination of the natural world is not the only adverse effect of the suppression of cannabis. Again, whether by design or circumstance, the legislation put in place to enforce the prohibition has served as a template towards the establishment of a repressive police state with an incremental curtailment of individual liberty. Under the guise of preventing damage from the "scourge of drugs", the population has been subjected to phone-tapping and other methods of surveillance, intrusive and often violent police raids and a range of chemical surveillance including enforced testing of hair, urine and saliva. The majority of the current prison population comprises non-violent drug offenders, especially in the United States where the privatisation of the prison industry has created a repressive but highly profitable industry for the Wackenhut Corporation and other prison industry players.

The damaging consequences of the prohibition are not restricted to individuals but are felt across the geopolitical sphere. Because much of the

cannabis and the other plant-based drugs are grown in Third World countries, political intervention under the guise of drug interdiction has been and continues to be manipulated for political purposes by serving as a pretence for military action. The invasion of Panama and the political turmoil in Afghanistan, Mexico and Colombia, to name a few countries, are the results of the militarisation of the War on Drugs. Despite the mass of evidence implicating the American military in massive-scale drug-dealing, including the importation of many tonnes of cocaine from South America to the USA to help fund covert activities, the drug war warriors continue to claim the moral high ground.

### The Growth of Hemp Industries

However, due to the tireless efforts of thousands of hemp activists around the world, the tide is slowly starting to turn. Cannabis hemp can now be grown legally in most countries, although the United States remains a notable exception. Whilst hemp industries are still a minor player on the world scene, their scale and range of products are steadily rising due to the increasing acceptance of the concept of industrial agriculture. In order to produce true sustainability, industrial agriculture seeks to use annual crops as the starting point for factory production, replacing mined inputs such as iron ore and coal. But can hemp and other select crops really make an impact on the looming environmental catastrophe?

Imagine your country one generation into the future, following the passage of a law requiring all industrial production to be completely non-toxic, biodegradable and sustainable. In this world, cars and many other things are now made of hemp bio-plastic. This material is not new. It was developed in 1941 by Henry Ford, who made a car body that was one-sixth the weight of steel but had 10 times the impact resistance. Documentary footage of this remarkable achievement is available on the Internet. Future generations will never know what a panel beater actually did, and the insurance industry will be much downsized. Perhaps, in this future world, those responsible for suppressing such valuable green technology will finally be brought to task.

### • Paper and textiles

Australia earns about \$400 million a year by selling chips from old growth forests, but we import finished paper products to the value of \$1.4 billion.

In the future world, the use of trees and chlorine in paper-making is now a receding memory. Modern non-

wood paper-making factories operate surrounded by green fields of hemp. The billions of dollars saved on imports are invested into massive reforestation programs, stabilising erosion and facilitating the return of biodiversity. Synthetic fabrics are long gone, replaced by breathable natural textiles of hemp, ramie and bamboo.

### • Building and construction

Hempcrete is a building material manufactured from the chipped inner fibre of the hemp stalk. Mixed with lime, ground slag or other additives, it forms a cellulose cement lighter than conventional materials but with improved thermal and acoustic insulation properties. The material is fireproof and completely resistant to termites.

Hempcrete revolutionises home building in the future. It sets like concrete but can be cut like timber. Any

unwanted structure can simply be ground up and thrown into the new mix. A more "organic" style of building can develop, because it is now a straightforward process to rearrange internal walls and make any other changes to a home to suit changing family needs. In some European countries, nearly half of all dwellings are owner built.

Furthermore, hempcrete dramatically reduces the cost of housing by simplifying

construction; for example, a roof cast of hempcrete reinforced with bamboo can replace a tiled roof, fascia and guttering. This roof will have better thermal and acoustic insulation than the tiles, will be resistant to hail and will greatly reduce the risk from bushfire.

In addition to its direct benefits in construction, hempcrete functions very efficiently to sequester carbon dioxide. Bio-sequestration is the process by which plants take up carbon dioxide and water and use the Sun's light to synthesise glucose and then cellulose. If the cellulose is used in long-lasting structures, then the atmospheric carbon dioxide is effectively removed or "sequestered", improving the weather health on Earth. The average Australian family generates about 10 tonnes of carbon dioxide each year. One hectare of hemp can sequester up to 20 tonnes of carbon dioxide annually. The average hempcrete house would sequester about 40 tonnes. When a house is made of hempcrete, it is not only this direct carbon dioxide which is saved.

Using bricks, tiles and other fired ceramics, though, generates a huge amount of carbon dioxide in manufacture. An average brick house generates up to 500 tonnes of carbon dioxide in its total construction,

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and the housing industry generates a large proportion of the country's domestic carbon dioxide output. A large-scale change in building methods would facilitate our compliance with targets such as, or preferably exceeding, Kyoto Protocol levels. The doomsayers may claim that compliance with such a protocol would harm the economy, but a large-scale transition to hemp-based paper, textiles and building industries would provide a massive economic stimulus, creating quality employment and export opportunities—unlike the short-sighted consumer-based stimulus strategies currently in use.

### Hemp Seed in Health and Medicine

In the areas of health and medicine, the use of hemp could lead to dramatic improvements in society.

Hemp seed is one of the richest sources of ALA (alpha-linolenic acid), the plant-based form of the essential fatty acid omega-3. ALA has an 18-carbon backbone, which is elongated in the body to a 22-carbon chain to form DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid). In this form, omega-3 is incorporated into the brain, forming a critical part of the neuronal membrane.

Omega-3 from marine sources occurs as DHA and EPA, and taking omega-3 in this form bypasses the need for the conversion. However, ALA has beneficial effects itself, and using marine-derived omega-3 places a severe strain on the aquatic environment. Further, omega-3 is a very reactive molecule, and the harsh industrial conditions used in the extraction and deodorisation of the oil leave it with less than optimal activity, with detectable levels of contaminants including mercury and polychlorinated biphenyls (PCBs) found in many commercial samples.

Fortunately, most individuals can readily convert ALA to DHA and EPA in sufficient quantity for optimal brain development. Luckily, two groups with particular need for DHA and EPA—pregnant women and young children—are particularly efficient at this conversion. The enzymes responsible for the conversion can be impeded by an excess of saturated fats, so for optimal results these must be reduced in the diet.

There are two essential fatty acids: omega-3 and omega-6. They are referred to as "essential" because they cannot be synthesised by the body but must be obtained from food. The ideal ratio for optimal health

between the intake of omega-3 and omega-6 is one part omega-3 for each three parts of omega-6 (1:3). The industrialisation of the western diet and the consumption of mass-marketed canola and other inferior oils—which have little omega-3 content in any case—has had the critical effect of seriously reducing the omega-3 intake whilst at the same time dramatically increasing the omega-6 intake.

The body maintains homeostasis by a dynamic balance between opposing forces; for example, the musculoskeletal system balances opposing flexion and extension muscles to maintain posture. Biochemically, the body maintains its interior homeostasis by delicately balancing pro-inflammatory and anti-inflammatory effects. The body must be able to mount

an effective inflammatory response to repel microbial invaders and as an adjunct in wound healing, but it must then be able to down-regulate this inflammation to prevent unwanted collateral damage to adjacent tissue.

In general terms, the omega-6 fatty acids and their derivatives are pro-inflammatory, whilst the omega-3s produce mediators which down-regulate the inflammatory response. With a predominance of omega-6 and a deficiency of omega-3, the body is in a permanent state of excess inflammation. The release of inflammatory cytokines initiates the process of tissue damage which, if the process continues long enough, manifests as illness such as vascular disease, loss of vision and dementia. When the synovial joints are affected, osteoarthritis results, causing much pain and suffering for a large proportion of the population.

Like knights in shining armour, the pharmaceutical corporations

offered their response: the non-steroidal anti-inflammatory drugs (NSAIDs). These chemicals are based on aspirin but have been modified to exhibit a more rapid effect, better analgesic properties or some other characteristic to give their product a marketable edge over the competition. NSAIDs have generated an industry with multibillion-dollar sales annually, despite the fact that they are responsible for the deaths of hundreds of thousands of people globally. As a spin-off advantage for the corporations, the most frequent side effect of the NSAIDs is gastric irritation, often leading to ulceration. To the NSAIDs billions were added the billions of dollars from the sales of antacids like Zantac® and more recently the proton pump inhibitors.

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All this expensive medicine and the progression of the disease is barely slowed, with the hapless patient then requiring complex surgery to manage the damaged joint. Is any of this really necessary?

People who strive to maintain a reasonable omega-3 to omega-6 balance and also keep their bodies free of oxidative stress by regular intake of natural plant-based antioxidants are generally not troubled by osteoarthritis or other degenerative diseases. Also, they are rarely troubled with blood pressure problems and they have no need for antidepressants—two major money-spinning drug groups for the global pharmaceutical companies.

The modern pharmaceutical industry appears to be bent on a course to medicalise the population for conditions which are often caused in the first place by their subsidiary companies in the food industry.

Over the last century, cane sugar has gone from being a rare luxury food to a massively overconsumed health risk. Added in large quantities to soft drinks and most processed foods, in the sedentary body it causes wild swings in blood sugar with mood disturbances and widespread oxidative stress as the excess glucose attaches to haemoglobin and tissue or is transported to adipose stores where it adds to a swelling girth.

The type II diabetes epidemic continues unabated, while key culprits like McDonald's use PR gurus to re-invent itself as a health food restaurant while still peddling the same toxic mass of saturated and *trans*-fats and sugar that they call food. The derangement of the diet leads to disturbances in blood chemistry, especially the lipid profile, with increases in low-density lipoproteins and total cholesterol.

Based on pathological studies showing cholesterol in artery-narrowing atheroma, the medical and pharmaceutical establishment devised the cholesterol theory of heart disease, claiming that high levels of serum cholesterol impregnates itself into the arterial wall, thereby causing disease. With cholesterol as the number-one bogeyman, the pharmaceutical industry then presented the frightened public with magic bullets—the statin drugs—certain to cure all their problems. These drugs cause serious side effects but, despite this, the statins have grown into a multibillion-dollar industry. Yet there are many weaknesses in the cholesterol theory, and the observed facts are better

described by considering oxidative stress as the key initiating event in atheroma formation.

Oxidative stress results from the action of oxygen free radicals. Free radicals are unstable molecules with unbalanced electron clouds that can damage any tissue with which they come into contact. These free radicals are an inevitable result of biochemical respiration. However, oxidative stress is dramatically increased by exposure to toxic chemicals, additives, volatile fumes and electromagnetic radiation.

Like sparks flying from a campfire, free radicals can cause damage to the tissues in which they occur if they are not quenched. In its well state, the body is equipped with an impressive endogenous antioxidant system, and exogenous antioxidants are found abundantly in tree- and vine-ripened fruits and berries as well as vegetables.

According to the oxidative stress theory, disease results from an inflammatory reaction occurring around sites of oxidative injury. When atheromatous plaques are subjected to careful biochemical analysis, it is found that the cholesterol in the plaques, ingested by immune cells known as foamy macrophages, is actually rancid. Rancidity is the state of an oil that has been subjected to oxidative stress from excess light, heat or chemical exposure, in the absence of sufficient protective antioxidants. It is the rancidity of the oil that initiates the inflammatory reaction to cause the plaque, not the cholesterol itself. The proper treatment should be to address the oxidation, not to manipulate the level of cholesterol artificially.

Additionally, oxidative stress on the membrane of the platelets renders them overly "sticky", setting the stage for a vascular event, whether a myocardial infarction, a cerebrovascular accident or ischaemia of a limb. Whilst certain genetic characteristics of an individual or a group may render them susceptible to oxidative stress in a particular site or tissue, the underlying pathology remains oxidative stress.

Without wholesale dietary and lifestyle changes, the health of the population will continue to deteriorate. People will fall victim to a range of chronic degenerative illnesses until society is unable to afford the health care costs involved. The current unbalanced, devitalised, demineralised and generally deficient national diet has led to preventable conditions imposing a serious social and economic cost on the community. It is estimated

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that up to 90 per cent of Australian schoolchildren are not getting optimal quantities of omega-3, and this can be expected to impact on brain development and intellectual functioning.

An ideal intake of omega-3 is also required for the optimal functioning of the immune system. Deficiencies can manifest as allergies, autoimmune diseases and other expressions of immune dysfunction.

Hemp seed offers a unique combination of important nutrients, including a balanced ratio of omega-3 and omega-6 and an impressive array of vitamins and minerals. Hemp seed has a particularly high level of vitamin E, which is a potent antioxidant protecting the omega-3 from rancidity. Vitamin E, so often deficient in a diet of processed foods, is critical for vascular health by maintaining the pliability of the blood vessel walls. The protein in hemp is balanced and easily absorbed.

### The Politics of Hemp Foods

Australia is the only country on Earth which still has restrictions on advertising the food uses of hemp seed. It is permissible to use the product topically but not as food—such as hemp seed butter, ice cream and health bars. (This is a similar situation as with raw milk, where overzealous regulators have restricted a product based on poor science, economic self-interest and political bias.)

Hemp seed is currently not licensed as a human food in Australia. In 2002, an application was made to include hemp foods, but it was rejected after political intervention by the previous conservative government. In 2009, Food Standards Australia New Zealand (FSANZ) accepted an application to have the code modified; the decision on this application is pending.

However, in our future world, things are running more smoothly. The legislation requiring all products to be completely non-toxic has seen the end of the junk food industry. After only a few years of eating a wide range of hemp seed-based foods and adopting other health-promoting practices, the benefits are being seen in the population. With the reversal of the diabetes epidemic, there are huge savings in health care. The surplus is spent on expanding the cycle networks around the cities and other public health amenities. Maternal and perinatal health improves, and there is a reduction in the currently alarmingly high level of asthma in children.

Optimised nutrition brings many advantages. Like a fire that is brightly stoked instead of smouldering and smoky, the metabolism becomes more efficient at converting food to energy. The mental and physical vigour of the population increases and we are ushered into a renaissance of learning and creativity. Released

from the shackles of junk food toxicity, the human mind is free to explore new ways of interacting and dealing with formerly intractable problems and we are ushered into a new era of peace and prosperity.

But how likely is it that we will ever see the passage of legislation aimed at ensuring the health and prosperity of the Earth and all the people on it? The economic and political systems at the present time appear to be controlled by a cabal of crooks with the moral integrity of reptiles. In a world crying out for satisfaction of the basic needs of food, clean water and shelter, over 70 per cent of the world's scientists are employed by the military.

The financial stresses imposed by the current economic situation make it a full-time occupation for most people just to feed, clothe, shelter and educate their families. Having the time and energy to engage constructively in the political process is a luxury few can afford and, with the media's focus on one irrelevant issue after another, it has become the 21st-century version of bread and circuses.

The interpretation that all plants and animals have been created for the use of humans has reinforced the message of separateness and paved the way for the ruthless exploitation of the natural world that is now a looming threat for the entire biosphere. The industrial use of hemp and other fibre plants on a massive scale can cure many of the global environmental ills while generating significant economic benefits. The use of hemp foods can heal and revitalise the population. But can the juggernaut of avaricious capitalism, with its indoctrination to mindless consumerism, be overcome in time to save what precious remnants we have of the natural world before they are obliterated?

What is required is a complete revolution. No adjustments, amendments or other tinkering made to the current economic system can begin to approach a solution. A revolution in humanity's relationship with the natural world needs to be the starting point for this process. Then we may have a chance to pass that critical piece of legislation that prohibits products that are not completely safe and non-toxic, rather than continuing with the current situation of prohibiting the solution. ∞

### About the Author:

Dr Andrew Katelaris graduated with a Bachelor of Medicine from the University of Sydney in 1985 and in 1992 was awarded a doctorate by the University of New South Wales for a research thesis in immunopathology.

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He has over 20 years' experience in hospital-based medicine and surgical and forensic pathology.

Dr Katelaris became involved with industrial hemp during the 1980s with research aimed at preserving Australian natural forests. He discovered the suppressed history of industrial hemp and began to link up with hemp activists around the world. In 1988, Dr Katelaris visited Wageningen University in The Netherlands, where he learned of progress with non-wood paper production, and also visited hemp producers in France. On his return, he and other activists began a campaign to establish hemp in Australia. He teamed up with documentary filmmaker Barbara Chobocky to produce *Billion Dollar Crop*, the first mass-circulation television exposé of cannabis prohibition, which generated significant public support. As a result, a research licence system was established, allowing agronomic hemp trials. Diverse growing sites were tested and experience was gained, e.g., in increasing fibre yield by manipulating planting sites at different latitudes.

In collaboration with Southern Cross University (Lismore, NSW, campus), Dr Katelaris obtained a licence to cultivate high-THC cannabis for phytochemical analysis and stability testing on extracts, in preparation for a compassionate cannabis access scheme. This program was terminated for political reasons, and Australia has yet to establish any compassionate access scheme, as operates in many countries around the world.

Dr Katelaris's current research interests include improved methods of hemp agronomy, better seed-harvesting methods and the development of hemp building materials (hempcrete) suited to Australian conditions. He is committed to developing greater public awareness of the benefits of hemp seed nutrition. Of special interest is the place for hemp seed nutrition during pregnancy and childhood and the therapeutic use in managing inflammatory conditions, behavioural disorders and depression.

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