The Real Story of Milk

Deidre Wicks

Editor's Note

This book was being researched and written by Deidre before her death four years ago. I have included her completed Introduction and Chapter one. For this special edition of ASJ, which honours Deidre's vision for the book, I invited scholars who knew her work to contribute a paper which resonates with one or more of her proposed chapters.

Introduction

The Introduction will outline the purpose and scope of the book, combining accessible discourse with the disciplinary traditions of Critical Animal Studies and Sociology/ Anthropology. It will specify the ways that the concepts of Silence and Denial,[1] Willful Blindness[2] and Marxist Political Economy can assist in providing a unique, multi-dimensional perspective on the history and culture of milk-drinking and dairy production, with a focus on the Australian story.

Chapter 1

Why do we drink milk? How did we come to drink it?

This chapter will look at the history of milk-drinking and cover issues concerning the 'naturalness' of milk-drinking and our long historical association with and attachment to milk and other processed dairy products such as butter and cheese. It will examine the way that these food products have also become economic products which are deeply embedded in world financial and trade relations. Questions are now being raised as to the long-term viability of animal agriculture, including milk production. Is it realistic to envisage a world without dairy, especially cheese?

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[1] Stanley Cohen, *States of Denial. Knowing About Atrocities and Suffering*. Polity Press, 2001; Deidre Wicks, 'Silence and Denial in Everyday Life: The Case of Animal Suffering.' *Animals*, vol. 1, no. 1, 2011 pp.186–199.
[2] Margaret Heffernan, *Wilful Blindness: Why We Ignore the Obvious at Our Peril.* Walker & Company, 2011.

Chapter 2

Is milk good for us?

This chapter will evaluate the scientific evidence on milk and health, particularly concerning the issue of calcium and healthy bones, and address some of the claims surrounding the positive attributes of milk consumption. It will analyse evidence concerning plant-based milk and do so in the light of official advice from government research bodies such as the NH&MRC and the World Health Organisation. I will also examine the financial connections between professional bodies like the Dieticians Association of Australia and the dairy industry.

Chapter 3

How has dairy farming changed in Australia over the last 200 years?

In this chapter I will look historically at the role of the State in the support and promotion of the dairy industry, and at the way dairy farming has taken on a myth-like quality which represents the quintessential 'Aussie battlers' who sacrifice comfort and security to provide us city folk with fresh milk. In this narrative, they need and deserve our understanding, sympathy and support. However, distracted by this image production, we have been blind to the changes in dairy production, which has evolved from small-scale family-run farms to intensive style agriculture that now bears many of the hallmarks of factory farming. How did we miss this?

Chapter 4

Why does modern milk production result in poor quality lives for cows?

In this chapter I will describe the key welfare issues for dairy cows and their calves and explain why these issues are an inevitable result of mass production, intensive dairying. I will

examine the ways in which Australian dairy industry practices differ from European and US approaches and assess future trends.

Chapter 5

Don't dairy cows have legal protection?

This chapter will look at the way animal-based industries rely on carefully choreographed public perceptions that animals are protected by law. In this context, I will then examine the adequacy of the Australian Animal Welfare Standards and Guidelines for Cattle.

Chapter 6

Why are Australian dairy farmers struggling?

This chapter will examine the economic forces that are impacting on the dairy industry throughout the world and the options for Australian dairy farmers who are experiencing financial pressures. It will include discussions and interviews with dairy farmers who hope to stay in the industry and those who have left – either by pressure or by choice.

Chapter 7

Is it a good thing that China is buying so much powdered milk and baby formula from Australia?

In this chapter I will look at the arguments implicit in Australian trade policy which hold that dairy products (along with live cattle and sheep) are a long-term substitute for coal (indeed, it has been called 'white coal' for this reason) and can contribute to a solution to our balance of payment challenges. I will analyse the effects of increased dairy consumption on Asian and South-East Asian countries, which are our main target markets.

Chapter 8

Is milk production environmentally sustainable?

This chapter will examine the environmental impact of modern dairy farming on land and water and will include both national and international evidence. It will make a comparison with organic dairy farming, including the financial viability of such farms and their implications for animal welfare.

Chapter 9

Is it possible to have cruelty free, environmentally sustainable cows' milk?

In this chapter I will examine three main options for the future, highlighting their strengths and also their limitations:

1. Welfare improvements alone
2. Abolition of the dairy industry
3. Transitional programs towards being 'dairy free' that take into account the welfare of both farmers and animals. This will include a discussion and outline of a 'Just Transition' with recourses for dairy farmers and retired cows.

Conclusion

The final chapter will summarise the preceding material, focusing in particular on the way that a transition plan for the dairy industry could be at the forefront of more sustainable economic and social practices for the planet. Such a plan will also be presented as an important part of the drive for a carbon-neutral future, which takes into account our treatment of other species, in this case dairy cows and their calves. It will both recognise and show a way out of our addiction to 'white coal'.

Introduction

There are so many books written about milk! Why add another one? That is a reasonable question. Here is another one. Who reads them? That is a more difficult and slightly embarrassing question. I can't say for sure, but my guess is fellow milk aficionados, be they historians, food historians, anthropologists, sociologists, cultural historians or their students. My challenge with this book is to write it so that a wider community of readers will be curious enough to take it on. So far, I have been very unsuccessful. Every article, Report, blog or essay that I have written on milk has been comprehensively ignored by my wider circle of non-academic friends, notwithstanding its style of presentation.

Eventually, my husband broke the news to me: 'they don't want to read it. It's too hard'. He didn't mean too hard to understand, no, he meant 'these facts are too hard to know'. And that is the dilemma: the facts of milk are hard to know. It is essentially a cruel business and yet its consumption is condoned, encouraged and permeates our society and culture from the family through to supermarkets and cafes, and restaurants. We love it. We consume it and its related products in huge amounts. This makes for a potential dilemma for which there are three possible solutions:

1. Remain ignorant of the facts and keep consuming.
2. Know the facts and keep consuming.
3. Know the facts and make big dietary changes that involve giving up a pleasureful and nutritional food.

Option 1 is the clear choice for most people who like to think of themselves as good and ethical people. This is made easier by an industry that constantly presents an image of an idealised product to its consumers.

Yet, as Stanley Cohen has shown us, self-deception or denial is hard work. It is an ongoing, social and political as well as an individual process. This dilemma is also represented in the literature. On the one hand we have what E. Melanie Dupuis calls the 'Perfect Stories' or positivist histories of milk and the 'food appreciation' histories which

outline the way milk became 'safe' through the application of modern science and technology and became affordable and widely available to huge populations. There are also the hagiographic food histories which focus on milk products like cheese, butter and organic milk. These accounts of the origins, history and current developments in milk almost universally and comprehensively ignore issues of dairy cow welfare (as does Dupuis' critique of these approaches).

On the other hand, we have the animal focused literature which details the cruelties and milk production consequences inflicted on dairy cows and their calves. These accounts ignore deep cultural, and sometimes religious, traditions and significance of dairy in people's lives. They also ignore the pleasure people take from milk, cheese and butter. They have the potential to create real dilemmas for people: 'please don't ask me to give up cheese!' 'How can I bake without real butter: it just doesn't taste the same!' 'What am I supposed to give my baby/toddler when I can't breastfeed?' The easiest solution is to ignore the animal focused literature, which most people seem able to do. This has resulted in separate audiences for different versions of history and reality which reinforce different world views and rationales for different ways of consuming.

I suggest that we can ignore neither the dairy cow and her conditions of life, nor human history and culture. If we agree that it is time to take a closer look at an industry which has changed so comprehensively over 200 years that it is unrecognisable and yet is presented as unchanged, then this kind of approach is timely. If we can also agree that it is wrong to deny animals pleasurable conditions of life, at the same time as acknowledging that some dairy products give us pleasure, then perhaps this book might reach a wider audience.

I deliberately include the economic plight of dairy farmers and family-owned farms. Farmers may be lumped together as a group despite the fact that many farmers are fond of their cows and do their best to look after them well. These farmers are angered by such accounts, which they see as written by middle class, urban based researchers who know little about the realities of day-to-day life on a dairy farm. For this reason, this book will address the plight of a selection of these farmers and will present information based on personal

interviews. At the same time, the plight of these farmers and the widespread public sympathy expressed for them can leave no space for concern about the dairy cow and her calf, who lie at the very bottom of the economic hierarchy.

Chapter one
The First Theft

Why do adult humans drink milk?

It is instinctive for mammal babies to seek the nipple and drink mother's milk. This is natural behaviour. Alone among other species, many humans continue to seek and consume the milk of another animal into adulthood. In many countries and cultures, including Australia, this habit has become so entirely normalised and naturalised it is rarely even observed, let alone questioned. In Australia our consumption of milk is built on our deep attachment to and identification with dairy products. Milk is a part of our childhood, our nurturing and our daily consumption. It is also a significant part of our commodity-based economy. Underpinning our daily purchasing practice is the belief that it is a natural product which is made for us and therefore that it is good for us to consume it as a regular part of our diet.

Is it Natural?

Milk drinking did not come naturally to adult humans. Ancient humans were not designed to drink milk and suffered severe and painful consequences if they consumed milk after early childhood. This is still the case today. It has been estimated that 75-80% of the world's population are unable to digest milk. Most humans are lactose intolerant because they do not produce the enzyme lactase and so are unable to digest lactose. While babies are born with

the enzyme lactase, it disappears after weaning and is gone completely by around the age of six. It was necessary for humans to develop a genetic mutation which allowed 'lactase persistence' into adulthood in order to be able to drink milk without symptoms. This came about either through a genetic or environmental pathway or the combination of both. Milk drinkers who came to rely on milk for survival evolved genetically to become lactose tolerant. This mutation was then passed on to future generations (Evershed, Davey Smith, Roffet-Salque et al). The gene travelled in blood-related tribes and family groups, so though most black Africans are lactose-intolerant, the Masai, who are cattle herders, are not (Kurlansky 4).

Who Drinks Milk?

The most likely groups able to digest milk are the descendants of European, Middle Eastern, North African and those from the Indian sub-continent (Kurlansky 4). This is because over many centuries the genes for lactose tolerance increased in populations that consumed milk; intermarriage between these cultures also increased lactose tolerance because the gene conferring tolerance is dominant. The normal decline in lactase production took place in people from cultures who had never kept dairy animals such as the indigenous people of North America, many Asian cultures and most indigenous Africans (Schmid 243). Indigenous Australians are traditionally, lactose intolerant (though this is changing for many urban and other groups). Adult milk drinking happened over a long period of time, was made possible by several coincidental developments and discoveries, and eventually conferred immediate, though some would argue questionable, long-term benefits for sections of the human species by which time it had become an ingrained part of both cultural and economic life.

As well as the crucial genetic mutation which brought about lactase persistence into adulthood, it was also necessary to have achieved extensive domestication of previously wild animals. This first shift from meat to milk production occurred around 6500 BC to 7,000 BC in western Anatolia where the settlers shifted their pastoralism from sheep to cows and the production of cows' milk probably began (Kindstedt 9). Given the lactose intolerance of

most adults, these first efforts of Neolithic humans to obtain milk from domesticated animals were probably to feed infants and children. Evidence for lactase persistence in adults did not become widespread in adult human populations until around 5500 BC in central Europe (Kindstedt 10). This means that when milk gathering began and became established in Anatolia, adult lactose intolerance was still the natural and universal state of the adult human population. Eventually, genetic mutations produced the genetic capability to drink milk into adulthood. The domestication of cows, sheep, goats, reindeer, horses, yaks and camels created the conditions which made regular milk drinking possible.

Why Did It Become Part of the Human Diet?

A key reason we began to drink milk was because it gave lactose tolerant humans a significant advantage in relation to nutrition, infant survival, territorial expansion and population growth. But there were other forces at play. When we study history, we sometimes see that bursts of creativity, invention and discovery occur together and at the very moments when their appearance will have the greatest effect. So it was with the seemingly choreographed discovery of cheese, which occurs through the separation of the curds and whey, and the discovery of the technologies which facilitated the practice. The key time was around 7000 to 6500 BC, with the discovery that heat could be applied to various materials such as clay, and various shapes of pottery could result. This allowed the storage, transport and processing of milk into other forms of dairy such as butter and yoghurt (Kindstedt 13). The huge significance of this turns on the fact that most of the lactose is held in the whey so that lactose intolerant adults could eat modest amounts of the curds, gain the nutritional benefits and yet not suffer the digestive consequences. These two congruent developments were a huge incentive for early pastoralists to experiment, develop and expand milk processing and cheese making.

How Was Cheese Discovered?

Humans have a very long historical connection to milking animals and consuming their milk. It goes back to the Neolithic period when our early pastoralists/cheesemaker ancestors discovered that something in the stomach of the baby herd animals could rapidly bring about the separation of the curds and whey in milk (coagulation). It is likely that Neolithic herders opened the stomachs of dead kids, lambs or calves and found coagulated cheese curd. It is clear from archaeological evidence that experiments began early with intentional coagulation (Evershed et al.). One cheese historian suggests that early experiments may have involved adding clotted milk from the dead baby animals' stomach to fresh milk, which is a practice continued up to the eighteenth century in England and America (Kindstedt 13). At some stage, the stomach material itself was added to milk which provided a much more concentrated source of coagulating enzymes and so improved, rapid and reliable coagulation. This is still the widespread practice today, although in some countries, including Australia, there is more extensive use made of vegetable rennet in cheese making especially for the large vegan and vegetarian market.

What About Butter?

At around the same time as the discovery and development of cheese making, we have evidence of butter making, which came from agitating the butter milk after the curds and whey had been separated (Khosrova 26). Neolithic pastoralists soon worked out that this dairy fat was not only useful for eating but also for fuel, cooking, medicine, personal grooming and religious ceremonies. With the application of heat, it could also be turned into ghee, which could keep for months without spoiling. Butter also allowed the lactose intolerant humans to consume a form of dairy before they developed lactase persistence and could consume liquid milk without painful consequences, which would take another thousand years. These developments also allowed the more rapid expansion of dairying, out of the Fertile Crescent, where environmental degradation had taken a terrible toll, and into

other areas, initially mainly northern Europe (Evershed et al.). By around 4500 BC Neolithic Near East culture dominated the Mediterranean basin, most of Europe, the Middle East and extended to the gateway of India. As peoples moved so did the knowledge and practice of cheese making. This created the conditions for the development of a huge array of specialised cheeses which would, over time, become enmeshed with the human diet and food culture.

Amid all the historic facts concerning the discovery, the chemistry, processing and the physical properties of cheese, we must not overlook the simple but crucial fact that it is likely that from the beginning, it seems that we liked it. We must not ignore or deny this part of our changed behaviour because it guides much of what happened historically as well as what happens today. Drinking milk and eating cheese and butter give us pleasure. Many people like the taste of it, the texture and the smell. And if it sits on the edge of the beautiful, of the dangerous and of the disgusting, that only makes it more interesting and more desirable. One of the mysteries of cheese, however, is the fact that more people don't find it disgusting. It is worth exploring this complex emotion further.

Is Cheese Delicious, Disgusting or Both?

Darwin described disgust as a universal emotion which refers 'to something revolting, primarily in relation to the sense of taste, as actually perceived or vividly imagined' (Darwin). Since that time there have been a variety of approaches developed, including the idea that disgust is mainly an oral defence: a defensive bodily reaction to prevent dangerous substances from entering the body via the mouth (Rozin quoted in Cohen and Otomo (eds). There is much debate about what makes an object 'dangerous'. For Rozin and Fallon, danger is represented by foods which contain pathogens, and which can therefore contaminate other foods. Because animal products decay quickly, they generally top the list of foods which cause disgust.

Mary Douglas developed an explanation based on the idea of 'matter out of place', and explained that the unclean', and the danger it represents, arise from matter which does not fit into socially constructed categories (84). For Douglas some substances were especially problematic such as those with sticky properties (in which she follows Sartre who described stickiness as an 'aberrant fluid', Douglas 38). For Douglas, danger lies in transitional states, states where a substance is not yet definable. This applies for instance to melting solids which are transitional and therefore dangerous (Douglas 96). The separation of liquid milk into a solid and a liquid through the process of curdling is a transitional and anomalous event – especially so when both are to be consumed as food. Clearly, this would seem to make cheese a likely candidate for a disgust response. Why don't more people experience this? Joy argues that this is because disgust is almost, if not entirely a learned response. We are not born with disgust schemas; rather, they are socially constructed belief systems that we learn. In relation to animals, the system dictates which animals and their products are edible and which are not. In this way we are protected from feeling any emotional or psychological discomfort or conflict when we consume certain animals and their products (18). These schemas are then passed on from parents to children. This normalises the consumption of animals and their products and bypasses the emotion of disgust. In the case of milk, cheese and other dairy, this process is made even easier by the fact that the cow is not actually killed in the process of giving milk. This has allowed dairy marketing to present an unbalanced picture of dairy which completely ignores the serious welfare problems for the dairy cow and her calf (e.g. Wicks 2018). There is now a large literature which details these problems which can no longer be ignored by the dairy industry, as an increasing number of people turn away from cows' milk and take up alternatives. It is a fact that the majority of dairy cows are killed prematurely and have lives of different degrees of discomfort and misery. Of course, no system is so powerful that it cannot be challenged and resisted and that has happened throughout history and continues with every publication and utterance that presents an alternative view.

Is Cheese More than Food?

From these crude beginnings, cheese has become more than just another food. Among many other guises, it has become a commodity which is enmeshed in and a founding force of race, class and gender relations, indeed, of capitalist economic and social relations themselves. In England, for instance, milking and cheese making became part of the feudal, manorial demesne system which began after the Norman Conquest of 1066. Under this system, which was conducted with the aim (even then) of high productivity and profit, the dairymaid was in charge and in control of the dairy (Kindstedt 143). The head dairymaid was responsible for the under dairymaids and for the efficiency, safety and productivity of the dairy. The unravelling of the manorial system in the fifteenth century saw the emergence of a separate class of yeomen farmer. These farmers took advantage of the larger tracts of land which became available to buy. Just as importantly, they took advantage of the knowledge and skills of the dairymaids who were forced to seek work and who eventually became employees of the yeoman farmers. In this way the knowledge of milking and cheese making gradually passed from the hands and minds of the specialized dairymaids and into the hands of the yeoman farmers (Kindstedt 160).

This transfer of knowledge and skills took on a new dimension with the Enlightenment of the 18th century, when the craft knowledge and skills of the dairywomen were published by science writers in scientific texts and became part of the male dominated public domain. Dairywomen ceased to be the sole guardians of dairying and cheese making as they were increasingly portrayed as backward, anti-scientific and finally, unhygienic (Kindstedt 173). This process mirrored what was occurring in the field of midwifery and healing, where male practitioners took over the space and knowledge of traditional women midwives and healers (Ehrenreich and English). In this way, the work of milking and cheese making helped to consolidate and form our habits, practices, relationships and our institutions.

Is it Possible to Envisage a World Without Milk and Cheese?

Given our long historical and economic connection with milk and our taste for it, is it realistic to propose that resistance and oppositional power could become effective enough to eliminate milk drinking and cheese making altogether? At this point in our history, there are contradictory signs, signals and pressures. The first point to make is that milk is powerful, cows are not. Milk is a valuable commodity in a world capitalist system which is based on private ownership, profits and lucrative trade agreements. There is money and power a plenty behind milk. Any challenge to its supremacy and money-making capacity has and will be met with powerful resistance. These figures give an idea of the extent of world milk production and its worth.

The Power of Global Dairy

The global dairy industry is huge and growing. It is worth more than USD 400 billion, produced by a global herd of more than 274 million cows (Franklin-Wallis). In 2017, US milk production alone was valued at USD 38.1 billion (ProCon.org). Worldwide, substantial quantities of milk, cheese and other dairy products are traded between countries. Nigeria, for instance, spends approximately USD 41 a day on imported milk powder ('Uncowed'). The US is the world's largest dairy exporter and in 2017 alone exported over USD 45 billion of dairy products (Statista). While for Australia, dairy is a relatively small player, we are still among the world's six major exporters (Dairy Australia*, Situation and Outlook 17*). Moreover, Australia exports nearly 40% of its total dairy production. Infant formula exports to China have been especially strong, earning AUD 334 million in 2016/17. Meanwhile, there is a global trend towards impoverishment of debt-laden small farms and their takeover by large, often multinational companies. In 2018 for instance, an Australian agricultural fund backed by a USD 129 billion (AUS 176 billion) pension fund, the Washington State Investment Board, purchased more than $50million worth of dairy farms in Tasmania's northwest. The Laguna Bay Agricultural Fund acquired eight separate

dairy farms around Smithton from private farmers where they have a target to be milking 10,000 cows (Cranston). This is the trend that has also engulfed dairy processors in Australia, the most notable being the takeover of Murray Goulburn by the Canada-based dairy giant Saputo, which is now Australia's biggest processor. Saputo reported revenues of USD 11.5 billion for 2018, paying around 10% tax on its earnings (Saputo Inc).

Support from Government

At the same time, the Australian Government provided large annual subsidies to the industry over many years; a prominent example is Dairy Australia, an industry-owned research and development organization charging a levy to members, which is then matched dollar for dollar by the government. These levies then become a further cost to the government, as members are entitled to claim tax exemption. Nor does this exhaust public funding support for the dairy industry as there is an array of additional programs, such as the Dairy Support Package, as well as various State level bodies and schemes. In addition to Dairy Australia, other powerful institutions include the Australian Dairy Industry Council, Australian Dairy Farmers, Australian Dairy Products Federation and the Australian Government itself. The latter also facilitates trade and export arrangements, such as the Trans-Pacific Partnership, and provides preferential support for dairy processors, retail outlets, policy makers, advertising agencies, biotechnology companies, schools and farmers.

From this brief outline, it is clear there are powerful economic and political forces at work to both protect and promote milk and dairy as an industry. Add to this our own cultural and gastronomical attachment and it seems as though the forces working for dairy look vast and virtually impregnable. This also becomes clear in consumption figures. World production of cheese is at least 22 million tonnes a year, up from 15 million tonnes in 2000 and is projected to expand as people in traditionally non-dairy consuming countries begin to import and cheese and other forms of dairy. In countries that traditionally consume cheese, consumption is also on the rise. In France, people consumed 27 kilos per person per year in

2015, a kilo more than in 2012. The UK cheese market has grown 13 % over the same period, and 92% of UK households buy cheese (Lawton 30). Demand for cheese has driven a major expansion of the dairy industry over the past 50 years. In 1970, world production of milk was about 480 million tonnes; it is now around 800 million tonnes. This has mainly occurred through the intensification of milk production and its associated health and welfare problems for cows and calves.

In Australia, per capita consumption of drinking milk is estimated at 103 litres. This is high compared to other developed countries and is partly explained by extensive marketing and government support, as well as growth of the 'coffee culture' as most people have milk in their coffee. There has also been growth in flavoured milk products. Cheese consumption is stable at around 13.4 kg per person, cheddar being the most popular, while there is also increasing consumption in non-cheddar types such as mozzarella and other artisan type cheeses. Annual butter consumption in Australia is around 4.7 kg per person, while yoghurt consumption is relatively high at 9kg per person per year (Dairy Australia, *Consumption Summary*). These are high and consistent levels of consumption and add to this the economic and political power of the industry plus the never-ending barrage of pro-dairy information and advertising which serves to 'mystify' the product (Wicks, 'Demystifying Dairy') as well as peoples willingness to remain 'blind' and in denial to the realities of milk production (Heffernan; Wicks, 'Silence and Denial'). Could envisioning a world without dairy be a waste of time and unrealistic? Or…

Are We Seeing the Early Demise of Dairy?

In recent years there have been significant inroads into uncritical milk production and consumption. While plant-based milk has a very long history (Linné and McCrow-Young), its recent growth has been huge. Worldwide, sales of plant-based, non-dairy milks more than doubled between 2009 and 2015 when they reached USD 21 billion (Whip and Daneshkhu). Recent market research estimated that the global market for plant-based beverages will reach USD 19.67 billion by 2023, with an annual growth rate of 12% (quoted in '"Pouring" Over Plant-Based Beverages' 4). It is important not to see this in isolation as we have also seen (above) that dairy milk production has also increased. Yet the growth in plant milk sales is impressive. In Britain, plant milk sales have grown by 30% since 2015, associated with a surge in vegan and vegetarian diets (Mintel quoted in Franklin-Wallace). This means that almost a quarter of British people are now drinking non-dairy milks ('Plant-Based Milks on the Rise'). This is especially the case in the 16-24 age group where 33% are drinking them. Some research indicates that concerns about health, ethics and the environment are driving the sales of plant-based milks (Mintel quoted in 'Plant-Based Milks'). Other studies present a different picture (see K.S. McCarthy et al.,2017).

In the US, more than one-third of households purchased plant-based milks in 2016, totalling $1.5 billion in sales that year. In 2017, non-dairy milks made another 9% gain over the previous year, reaching 1.6 billion in sales. At the same time sales of cow's milk fell by 22% between 2000 and 2016 ('"Pouring" Over' 4). Australia is no exception to this pattern; indeed, Australia has emerged as the second most popular market for alternative milks (Lucio). While the market for all varieties continue to grow, demand for almond milk has soared, moving from 20% of the non-dairy market to almost half. Soy has lost its dominant position, declining from almost 70% to less than half. At the same time, consumption of cow's milk has steadily declined so that plant-based milk now accounts for 7% of all milk consumed in Australia. This number is very likely to increase as the vegan and vegetarian movements continue to grow from a current 2 million (Bungard). Meanwhile dairy farmers are putting pressure on the federal government to follow the example of the EU and to

prevent products which are not made of dairy from being labelled 'milk' (Johnson). This is despite products like almond milk and coconut milk being known as such for hundreds of years.

While plant milks have been rising in popularity, this has not been the case for non-dairy cheese. Vegan cheese, has not up till recently, enjoyed a great reputation. This is starting to change with dedicated, artisan cheesemakers like Brooke Ravenscroft who now sells at various markets as well as through her online vegan cheese shop (Whitfield). For many people who want to give up consuming animal products, cheese is the hardest to give up (Lawton 35). The issue here is not just taste, it is also an issue of history, culture and artistry. Is there any way we could retain some tiny fraction of artisan cheese given the reality of people's attachment? I used to think that it was possible, if we did as my grandmother did and shared the milk with the calf, but that still leaves the problem of surplus calves, especially male calves who must eventually be sent to slaughter, even if that separation is delayed. I now think the hope is in plant-based cheeses, as hard and long as this transition may take. One of the problems with cheese is that people strenuously protect themselves from the knowledge of what happens on dairy farms. I have given friends reports on dairy welfare to read who have found every excuse not to read them. They don't want to know. I now think dairy cows belong in sanctuaries where they can live out their lives in peace and companionship.

The removal of dairy farms from the landscape would open pieces of land which could contribute to the 're-wilding' of certain places. This is already happening throughout Europe with the re-introduction of bison and wolves and many other species and on the Yorke Peninsula in South Australia where the plan is to re-introduce up to 20 endangered species from around Australia (McDonald). Some of these would be small Arks but given how little there is left of wilderness, every small contribution could add up to something significant, especially if there was a concomitant drop in beef production and consumption. A century ago, wilderness extended over most of the planet: today, only 23% of land and 13% of the ocean remains free from the harmful effects of human activities (Allan). In the

case of dairy cows, the process would involve voluntarily undoing domestication. This takes us back to the beginning of the story, around 6,5000 years ago when we first began to domesticate cows. We have examined some of the advantages that domestication of animals brought to homo sapiens. What were some of the other consequences for people and for the animals?

Domestication of Animals and Human Development.

Domestication of animals, milking and cheesemaking, would have involved the development of new skills, perhaps new forms of learning and communicating and the formation of new practices and rituals. All of these would have influenced the developing human brain. Inevitably, so would the closer and changed relationship with animals. Those who could coax animals to trust them and who cared for them may well have had an evolutionary advantage over those who used brute force. There is a theory that there could have been a gene for this tendency and that it has survived among those humans who today show a greater empathy toward animals (Bradshaw). Over time, different relationships developed between humans and animals rather than those which had dominated during previous periods when hunting was the primary relationship. Yet, while on the surface it may have appeared less violent, in another sense it widened and deepened the human sense of entitlement over animals. Barbara Noske has argued for a definition of domestication which considered both animal and human animal ecology. While most definitions revolve around ideas of capture, taming and use, Noske argued for a wider definition which states, 'that situation where humans force changes on the animal's seasonal subsistence cycle' (Wilkinson in Noske 6).

Domestication and Animal Development

This definition is much broader and starts to give us a sense of the enormity of the deep and ongoing changes gradually imposed on animals from the wild animal world. It changed our world and it also changed theirs. The changing practices associated with domestication of

animals contributed to changes in our way of living and being in the world and deepened both our dependence on and entitlement to the bodies of other animals. Whereas we had regarded them as food and as our right to kill and eat, domestication enlarged this to entitlement to interrupt their subsistence and eventually their breeding cycles, disrupt herd hierarchies and relationships, take their young to kill or raise separately, ultimately remove them from any contact with their wild relatives and eventually, to change the very shape and function of their bodies for our purposes. This sense of entitlement is buried deep within human consciousness to the point where our ownership and control over the lives of domesticated 'farm' animals, many who live lives of unmitigated misery, is taken as part of the natural order of things. It consolidated a way of thinking and a way of living in the world which effected human relationships and our relationship with all other species of animal, indeed with the natural world.

The Connection

This is the deep truth within milk consumption. Our attachment to it and our great survival advantage from it is layered on a loss of wildness for our now domesticated animals, many of whom live and die in appalling conditions, and on the loss of much of the natural world for ourselves and the wild creatures who still struggle for habitat and food. Beef production and consumption is another major contributor in this regard. By 2014 half of the worlds wild animals had been lost in the earlier 40 years because of habitat destruction, hunting and deforestation (*Living Planet Report*). Beef production and consumption has also had a major role in this and is part of the equation. The situation is made worse as global demand for dairy continues to increase due to population growth, rising incomes and westernization of diets in China and India. With this increasing demand for dairy comes more pressure on natural resources such as water and soil, as millions of farmers worldwide raise approximately 270 million dairy cows to produce milk ('Sustainable Agriculture: Dairy').

In Australia, a recent report by WWF-Australia has found that millions of native animals are killed each year due to the bulldozing of their forest and woodland habitat. In Queensland, over 90% of tree clearing is for conversion to grazing pasture for animal farming ('Millions of Native Animals').

Through a range of psychological techniques, as well as a measure of wilful blindness, we humans have generally turned our backs on these shocking facts and instead developed forms of silence, distraction, rationalization and denial and which allow us to concentrate on the pleasures of milk culture, milk recipes and the huge number of cheeses which enrich most cuisines.

These are the two inseparable constituent aspects of milk and dairy consumption. On the one hand, a loss for animals of their wildness and bodily integrity and for ourselves the loss of an ever-growing proportion of the natural world. On the other, adult milk drinking and the development of a dizzying array of specialised cheeses and recipes containing dairy products with implications for jobs skills, economies and eventually terms of trade. The two come together. They are part and parcel of each other. Yet they are presented and examined separately as though truth can reside in only one. For human and animal survival (both wild and domestic) we must see the connections, understand them and develop policy which is based on a knowledge of complexity and on the possibility of a healthy relationship with other animals and our long-suffering planet.

While the exchange of dairy for plant-based milks and cheese will not bring about the demise of the economic and cultural behemoth that is international dairy, it represents the beginning of a major transition. The following chapters will address key elements of this transition, including the development of a 'just transition' program for struggling dairy farmers. Such a program should encompass genuine consultation and appropriate investment toward their futures and toward the development of alternative occupations and industries. A further element of transition would be to stop breeding the vast numbers of calves worldwide each year. We have seen that dairy is big business and so is the huge international research and development industry around cow reproduction (Wicks, 'Demystifying Dairy'). This is the scale of the transition challenge.

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