



The Secretary  
Standing Committee on Health and Aging  
House of Representatives  
PO Box 6021  
Parliament House  
Canberra ACT 2600

Dear Ms Brown,

**Submission to Inquiry into the Health Benefits of Breastfeeding**

Please find attached my submission to the above inquiry.

I am an economist presently involved in research on the economic aspects of breastfeeding at the Australian National University. In the past my work has mainly focused on taxation and public finance. The opportunity for my current research has been provided by funding by the Australian Research Council (ARC) through a 3-year Fellowship, and a Discovery grant. I have recently applied to the ARC for renewed funding to extend this research through 2008-2012. A list of my publications in this field is at Appendix 1. These will be provided to the Committee.

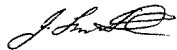
I also have 13 years experience as a volunteer breastfeeding counselor with the Australian Breastfeeding Association (formerly Nursing Mothers'). I have three children, ages ranging from 10 to 26. I experienced being a single unmarried mother with the first baby, and being without maternity leave, worked full time from when the baby was three months old. With better financial support, and a loving partner, I was able to work only part time while the other two children were young, and this made breastfeeding much easier. I am pleased that all three were breastfed according to the WHO recommendation for exclusive breastfeeding to six months followed by continued breastfeeding to 2 years and beyond. I hope that through the committee's inquiries, more women in Australia will be enabled to experience the satisfaction, confidence and joys of breastfeeding their babies as long as they wish.

My submission mainly focuses on economic aspects, as per the invitation.

Copies of my relevant publications will be provided to the Committee.

Thank you for the opportunity to contribute to the Committee's investigation.

Yours Sincerely



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## Submission to the Standing Committee on Health and Aging - Inquiry into the Health Benefits of Breastfeeding

'A private company that developed a baby product which nine in every ten mothers wanted, that halved the odds of baby getting sick and that added \$2.2 billion to the national economy annually would become a national icon. If the Productivity Commission saw that this product costs little to make but found consumers could only get costly and inferior alternatives it would demand urgent micro-economic reform.'<sup>1</sup>

### Summary and Introduction

#### Why 'the economics' of breastfeeding?

Economists have rarely considered economic aspects of breastfeeding, focusing their attention on the market economy. In recent years the importance of the unpaid economy including the care work of mothers has become more visible. It has also become evident that policy needs to take account of the unpaid household economy to avoid unintended impacts on the work that families do in raising children – Australia's 'human capital'.

Breastfeeding is a good example of women's reproductive work that is neither visible nor properly valued by existing economic statistics. Because it is neither visible nor valued, and because it competes in the market on unequal terms, breastfeeding remained unprotected from pressures of social and economic change and from 'unfair' market competition.

This results in declining breastfeeding, poorer health and development of infants, and increased national health system costs including for treatment of avoidable common childhood illnesses and chronic disease. It may also increase special education costs.

There is clear evidence that government leadership can and does improve breastfeeding rates, to the benefit of the national economy and the health system as well as to families.

These issues are discussed below in more detail.

#### Recommendations

- require all hospitals receiving Commonwealth funding to achieve Baby Friendly Hospital Status as part of Health Agreements with the States, and
- require monitoring of partial or complete formula feeding rates at hospital discharge as potential 'adverse events', which indicate poor quality of maternal and infant care
- facilitate development of milk banks and wet nursing for babies without access to their own mothers' milk
- recognise mothers' milk production in food statistics and GDP
- require health funds to encourage breastfeeding, such as through reimbursing costs of breastfeeding education classes, ABA membership, and lactation consultants services
- match dollar for dollar the marketing and promotion spend of the infant food industry through public funding of social marketing campaigns promoting breastfeeding as the norm for infants (and/or place effective limits on marketing and promotion of any foods and drinks products which displace breastfeeding of infants and toddlers).
- ensure all infant and toddler food labeling and information material conveys current health recommendations for 6 months of exclusive breastfeeding with ongoing breastfeeding to at least 12-24 months and beyond.<sup>2, 3</sup>
- provide public funding to publicise through the mass media the availability of skilled and experienced mother-to-mother support for breastfeeding via the Australian Breastfeeding Association's national helpline and local mothers groups.
- provide incentives to doctors and other health professionals involved in care of mothers and infants to undertake training and education on breastfeeding management and on professional ethical obligations under the WHO code
- provide Medicare rebate incentives to GPs to encourage and support their clients to breastfeed, as is currently done for vaccination
- protect breastfeeding investments against parental time and financial pressures by providing 6 months paid maternity leave
- educate and encourage employers to provide breastfeeding friendly workplaces for all new mothers

## Economic value of breastfeeding

Why place an economic value on breastfeeding? It can justifiably be argued that putting a dollar price on 'the milk of human kindness' is offensive and devalues what is a unique, and special relationship between mother and child. I acknowledge and agree with this.

Breastfeeding cannot be reduced to its economic aspects alone. Breastfeeding is a complex physiological, emotional, and social relationship between mother and child, which is in turn intricately related to the mother's family and the community or society she lives in. Economics is ill-equipped to deal with these aspects. Indeed, traditional economic models and social welfare optimums rely on concepts of scarcity, selfishness and competition between individuals. These concepts do not fit well where the predominant factors determining resource availability and allocation are altruism, dependency, and breastfeeding knowledge or skills, and where externalities exist in both consumption and production. Indeed, it would not be surprising for some women to resent attempts to place a market value on human milk production or breastfeeding.<sup>4</sup>

However, it can also be argued that placing an economic value on breastfeeding makes this unique contribution to community well being more visible to those who would otherwise be blind to it.<sup>5</sup> Valuing breastfeeding;

- emphasises the extent of breastfeeding and its value;
- gives positive recognition of one of women's unique contributions to society;

More comprehensive knowledge of the nature and locus of economic activity such as breastfeeding also contributes to more accurate public policy analysis, and more soundly-based economic, as well as health, policies.

Highlighting the national economic impact of breastfeeding serves to underline its importance to broad social and economic welfare, and the desirability of protecting it from replacement by commercially promoted foods.

In 'Human Milk Supply in Australia',<sup>5</sup> I used conventional economic tools for valuing non-marketed production to estimate the economic value of human milk produced in Australia. I showed that an economic value for human milk can be derived in three ways, consistent with the way the Australian Bureau of Statistics estimates the value of unpaid work in Australia. One way is to look at the cost of replacing the product with a near substitute – the equivalent here is a wet nurse. Another is to estimate the opportunity cost of time – we can estimate how long it takes to express milk for a baby and attribute a market wage to that time. Or alternatively, we can seek a market price for the product.

Some researchers have used the price of artificial baby milk to indicate the value of breastmilk. However, this is fundamentally a different product, and this approach can be criticized for ignoring the health costs of feeding non human milk to human infants.

A better alternative is to look at the price charged by human milk banks. In a number of countries, human milk is traded between hospitals, provided on prescription and paid for by health funds, or sold by non-profit or commercial milk bank operators direct to hospitals or mothers. According to the *Washington Post*, breastmilk is becoming a 'hot commodity', and is even bought and sold on the internet.<sup>6</sup>

- Recently a US company began marketing human milk which has been processed for use in hospitals for premature babies. The milk price is between US\$100-250 a day, or around US\$650 a litre.
- Meanwhile, US employment agencies also hire wet nurses – *The Washington Post* reports that the going rate in early 2007 is around US\$1000 a week<sup>6</sup>.

- Reports from China suggest a revival of wet-nursing among the wealth in that country,<sup>7</sup> ironically at a time that China has become the world's fastest growing market for commercial formula milk, and is facing growing problems of obesity and chronic disease.

Human milk production in Australia in 1992 was found to be 33 million kilograms per annum, compared to 16 million kg in 1972.<sup>i</sup> This is based on survey data for breastfeeding prevalence and daily milk yields for different ages of infants. This quantity of human milk had a market value ranging from A\$2.0 – 2.2 billion (US\$1.5 – 1.6 billion), depending on which approach – opportunity cost, replacement cost, or market alternative – was used. This is equivalent to around 0.5 of GDP, or 6% of private spending on food. From an alternative perspective, extensive artificial formula feeding during the 1970s reduced Australia's human milk production by over A\$1 billion a year compared to 1992 levels and by around A\$5 billion annually compared to the biological potential production. The current and potential value of human milk production is high compared to the total supply of commercial infant food, with artificial formula milk estimated to have an annual retail value of around A\$135 million.<sup>4</sup>

These earlier estimates of the market value of human milk may increasingly understate its current market value. As research accumulates on the adverse impacts of feeding bovine based milks or plant derivatives ('soy milk formula') to human newborns, and the market makes it available to those with enough money to afford it, it is likely that the market price of breastmilk and breastfeeding will continue to increase.

The above estimates do not include the 'insurance value' of breastfeeding, associated with the risk that commercial breastmilk substitutes become unavailable (for example, due to transport system disruptions, or widespread contamination events). It is well recognized internationally that breastfeeding provides food security for infants in times of conflict, natural disaster or economic disruption that may be denied to those depending on artificial substitutes. Since several formula fed infants died in Europe and the Middle East, it has also been recognized that there are serious safety issues<sup>ii</sup> associated with the use of manufactured infant milk powders because of the inherent risk of *E. Sakazakii* bacteria.<sup>8</sup> The economic implications of these food safety and food security issues for formula fed infants have not yet been examined by researchers, but in the current situation of increased risk of bioterrorism, rising global temperatures and extreme weather events, this is worthy of investigation.

*Breastfeeding boosts human capital, national productivity and Gross Domestic Product (GDP)*

National accountants recently began exploring how human capital can be measured within economic accounting frameworks for gross domestic product (GDP).<sup>9-11</sup> The ABS is among

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<sup>i</sup> Recent data on breastfeeding from the National Health Survey and other sources suggests little – if any – rise in human milk production in Australia in the past decade. In 2004, the price of milk had risen somewhat especially in the US but as the milk bank price in Europe remained about the same, the estimated value of the Australian human milk supply was still just over \$2.2 billion a year.

<sup>ii</sup> After reviewing the available scientific information, the FAO/WHO expert meeting concluded that 'intrinsic contamination of powdered infant formula with *E. sakazakii* and *Salmonella* has been a cause of infection and illness in infants, including severe disease which can lead to serious developmental sequelae and death'. It found that 'among infants, those at greatest risk for *E. sakazakii* infection are neonates (<28 days), particularly pre-term infants, low-birthweight infants or immunocompromised infants.' The Report commented that: 'It is important to note that powdered infant formula meeting current standards is not a sterile product and may occasionally contain pathogens. The meeting did not identify a feasible method, using current technology, to produce commercially sterile powders or completely eliminate the potential of contamination.'

those leading research in this field. In 'Mothers milk and measures of economic output', we drew attention to the official invisibility of women's reproductive work, which includes breastfeeding, in the national accounting framework.<sup>12</sup> In the economic realm, policymakers rely heavily on measures of Gross Domestic Product to guide decision-making and determine policy priorities. It is well known that this measure has many limitations as an indicator of economic activity, but the implications for infant feeding are less well recognized.

We argue that human milk production met the criteria set by the currently accepted national accounting rules (the United Nations' 'System of National Accounting') for inclusion in measures of GDP. In particular, commercial baby foods are counted in GDP, and if a farmer milks a cow and feeds the milk to his or her own baby, the ABS includes an estimate of its market value. However, despite international standards on the GDP treatment of commodities, GDP still excludes mothers' milk, even if mothers express it and give it to their baby or another mother's baby.

As a result of this omission, economic statistics are grossly misleading. During the 1960s and early 1970s, when only one in ten women breastfed to six months, the measured economic growth rate in Australia was artificially boosted by increased manufacture and sale of infant formula, and the higher health expenditures that went with it. Our earlier study of Australia's national accounting practices concluded that:

Due to the present ABS practice of excluding human milk, measured GDP would decline if more babies were breastfed. Present national accounting conventions mean the precipitous fall in human milk availability during breastfeeding declines of the 1960s and 1970s boosted economic growth, in spite of this actually representing an estimated fall in national food production exceeding \$1 billion a year and a worsening of infant health and nutrition status. These are ridiculous results and severely undermine the public credibility of GDP estimates and other economic data.<sup>13</sup>

The magnitude of the effects are surprisingly large. Achieving WHO international standards for 'optimal' levels of breastfeeding, with exclusive breastfeeding to six months and breastfeeding continuing to age two and beyond, would nearly triple the supply of human milk in Australia. In this earlier study, economic efficiency gains from increasing human milk production were greater than estimated gains for microeconomic reforms such as dairy industry or waterfront reform, and comparable in magnitude with deregulating telecommunications or utilities, or introducing a GST.<sup>4</sup>

In our more recent publication we have also argued that breastfeeding is an important 'care' activity which can be conceptualised as investment of maternal time in human capital formation, affecting the quality of the national capital stock, and future national productivity and GDP. Australia's human capital is worth around \$2,127 billion, compared to a national physical capital stock valued at around \$1,332 billion.<sup>11, 14</sup> There is new scientific evidence on the long term physical and mental health impacts of early brain development<sup>15, 16</sup>, which highlights the role of breastmilk and breastfeeding in facilitating normal health and development of infants and young children, and 'building' human capital.

Economic research on the economic return to investing in human capital typically considers only market investments, such as childcare centres or formal schooling, and ignores the major non-market investments made by families, especially mothers, caring for and educating children. Thus, the contribution of breastfeeding in infancy to later life economic outcomes has received little attention, despite recent advances in brain science and epidemiological findings linking formula feeding in infancy to mental underperformance and

chronic disease risk. Measuring the long term economic contribution to national productivity from this non market investment – the breastfeeding of infants - is a key focus for our future investigations.<sup>iii</sup>

This also points to the need to evaluate potential economic outcomes and national economic returns to maternal time invested during infancy (see below on the Time Use Survey of New Mothers (TUSNM)). We have commenced work to estimate the attributable health system costs of chronic disease from formula feeding in infancy (see below on '**Health system sustainability**', and submission by Smith and Harvey).

## Markets and marketing

Another argument for the usefulness of an economic perspective on breastfeeding is that, like it or not, breastfeeding does occur in a market context, so it is important to understand the economic and market forces which impinge on decisions about breastfeeding. This understanding of the market incentives around breastfeeding can inform public policy priorities and approaches, and help design more effective policies, programs and health interventions to protect and support breastfeeding. Understand the market incentives influencing breastfeeding decisions can also assist in more effective 'marketing' of breastfeeding to mothers, and to better use of public health budgets.

### *Markets, marketing and consumer choices*

'Mothers milk and markets'<sup>17</sup> analyses the 'market' for mothers' milk and explores the implications of viewing infant feeding in the context of exchange, and as a 'consumer' decision. It conceptualises breastfeeding as operating in a market, where 'market failure' is pervasive; where mother's milk competes with commercial breastmilk substitutes with a substantial promotion budget, and where lack of a 'level playing field' has adverse implications for breastfeeding.

This analysis shows that the dominant share of this market for infant food is accounted for by commercial baby foods. Using a market analysis it demonstrates that unrecognised social costs and information failures, 'agency' problems and unequal power relationships, along with unfair competition in the market for infant food, lead to a series of market failures that result in economically inefficient (and unfair) outcomes for society. It argues that the dominance of commercial baby food at the expense of breastmilk and breastfeeding reflects;

- 'ignorance of scientific evidence on the health risks associated with consumption of formula milk;
- agency problems arising from the mother necessarily making decisions on behalf of the infant;
- a pricing structure which does not recognise or incorporate the negative externalities associated with consumption of formula milk (for example, health related costs incurred by individuals and society later on in life); and,
- the unfair competitive and marketing advantage that commercial producers of breastmilk substitutes (private companies) have over other suppliers to the market (in this case mothers).'

There are two relevant markets. The first is the product market, that is, the commercial market for infant food products. The second is the labour market, because breastfeeding takes time, and so breastfeeding and babies can be considered to compete with labour markets and employers for mothers' time.

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<sup>iii</sup> In early 2007, I have sought ARC funding for new research into the economic implications of viewing breastfeeding as a human capital investment, which influences later life workforce participation and productivity through its beneficial effects on early learning potential and attainment, and later life chronic disease. If funded, it is proposed to measure the impacts of breastfeeding on later life chronic disease risk, labor market participation and productivity, and GDP.

Regarding the product market, my recent publication 'Formula for Fatness' in a book called *The Seven Deadly Sins of Obesity* examines the economic history of the market for infant formula and baby foods in Australia.<sup>18</sup>

This study reported data showing a massive decline in breastfeeding in Australia associated with increased advertising and promotion activity to mothers and doctors from the 1950s. Aggressive market competition was triggered by postwar global dairy surpluses and saturation of US baby food markets.

This is apparent in Figures 1-4 below.

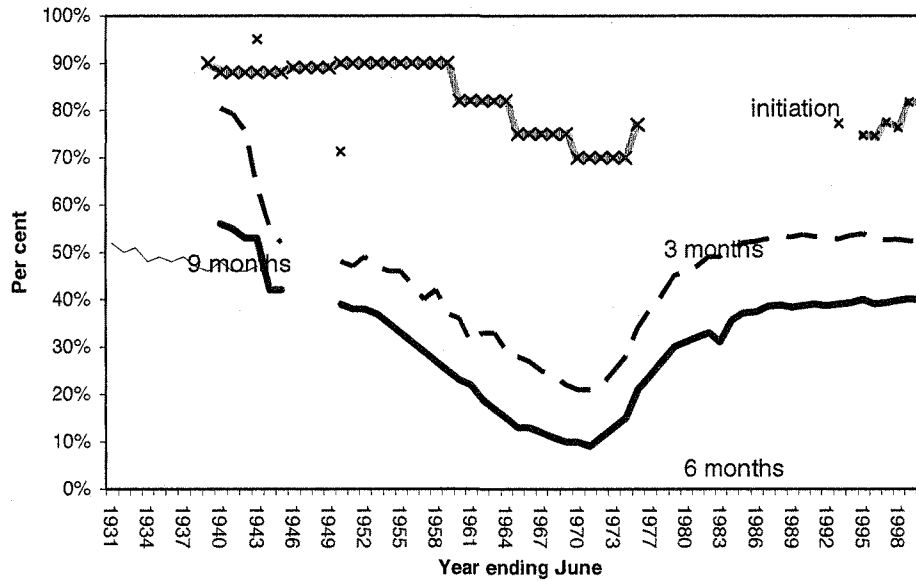


Figure 1: Breastfeeding trends in Australia, 1904-2000<sup>18, 19</sup>

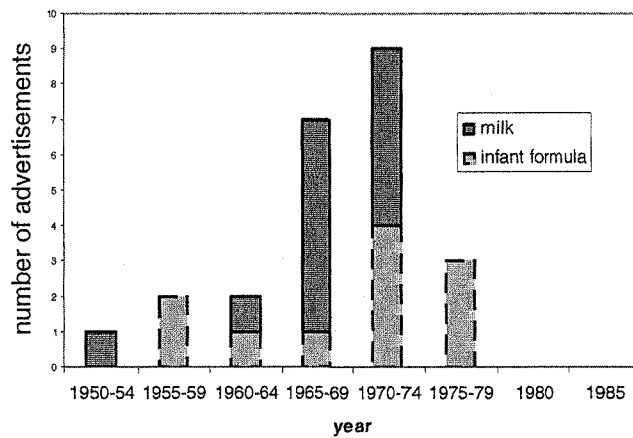


Figure 2: Advertisements for infant milk products in the Australian Women's Weekly 1950-1985<sup>18, 19</sup>

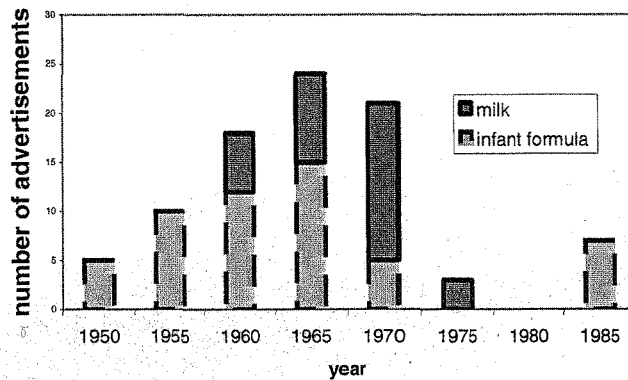


Figure 3: Advertisements for infant milk products in the Medical Journal of Australia 1950-1985<sup>18, 19</sup>

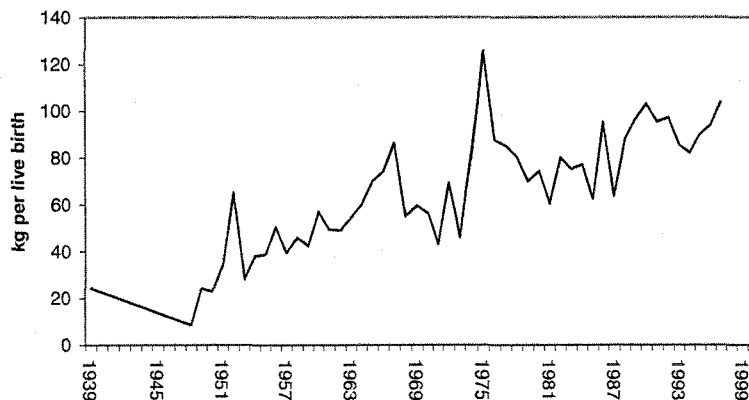


Figure 4: Infant milk products sales in Australia, 1939-1999<sup>18, 19</sup>

This research shows that the mechanism for this marketing effort was close collaboration between industry and health professionals. It also highlights that the healthcare system and the food industry, and not just individual mothers' choices, have contributed to poor infant nutrition and obesity trends in Australia.

Australian hospitals were described as 'display cases for formula feeding' by the 1970s, and hospital practices have been a major barrier to breastfeeding for several decades.<sup>20</sup> Compared the hospital practices of the day with the World Health Organisation (WHO) 'Ten Steps to Successful Breastfeeding',<sup>21</sup> shows how hospital practices of that era could not have been better designed to reduce breastfeeding.<sup>iv</sup> Some of those practices continue today in Australian hospitals, as it takes a long time to change established practices and beliefs.

As a consequence of these hospital barriers and associated commercial marketing and distribution of breastmilk substitutes through the health system, most Australians born between 1955 and the early 1980s were exposed to artificial feeding in early infancy. Furthermore, most Australian infants are still partially fed with artificial baby milk at some stage in the first 12 months of life.

<sup>iv</sup> These evidence based guidelines for maternity services underpin the highly effective WHO/UNICEF Baby Friendly Hospital Initiative.



The increasing evidence that formula feeding increases obesity risk is explored in a forthcoming publication on the contribution of infant food marketing to the problem of obesity in Australia.<sup>19</sup> While a range of factors clearly contributes to current high incidence of adult and pediatric obesity, the epidemiological and historical links between rising rates of obesity, and post-World War II changes in infant feeding practices should not be ignored.

'Formula for fatness'<sup>18</sup> also considered whether higher labour force rewards for mothers could explain the fall in breastfeeding from the 1950s, and demonstrates using wage rate and workforce participation data that it did not. However, the data suggest that competition from the labour market may have contributed to the low rates and short duration of breastfeeding since the 1980s. Because of inflexible workplace attitudes and practices, a significant number of women who successfully established breastfeeding reported in the National Health Survey that they discontinued it when returning to employment during the first 6 months.<sup>22</sup>

#### *Taking time to breastfeed*

Recognising the potential labour market competition with breastfeeding highlights that breastfeeding is beneficial for the baby, may be satisfying for the mother, and saves economic resources and health costs, but it can be economically burdensome for the mother or her family because it is time intensive.

In developing countries, where access to retail outlets and town water may be difficult, and women's work is often organized flexibly in an informal or subsistence labour market, breastfeeding saves time. However, in a developed country setting, formula is easily and quickly acquired and used, and inflexible workplace arrangements and attitudes may make breastfeeding difficult for the working mother. Research I conducted in 2005-06 has shown that the economic time cost to the mother can be very high. My nationwide Time Use Survey of New Mothers showed that mothers breastfeeding according to NHMRC breastfeeding recommendations<sup>3</sup> spend 16-17 hours a week breastfeeding for the first 3-6 months, along with additional 'emotional' care hours of 6-11 hours a week. Secondly, only one in four mothers had any access to paid leave in Australia, so new mothers pay a high price in lost wages.<sup>23</sup> This research suggests the importance of ensuring paid maternity leave for 6 months for all mothers, and the need to promote 'breastfeeding friendly' workplaces.

Also the amount of time mothers spent in 'emotional care' activities (soothing, holding and settling the baby) appears to show a dose-dependent relationship to the degree of exclusivity of breastfeeding. This points to the possibility that the process of breastfeeding encourages mothers to interact with their infants intensively, suggesting a possible new explanation for cognitive and other developmental differences between formula fed and breastfed infants (See separate submission by Smith and Harvey).

#### *No 'rational, informed choice, or 'level playing field' for Mothers Milk Incorporated.*

Industry figures estimate global sales of infant food at around \$21 billion a year. ABS data on household expenditures on infant milk products suggested an Australian market of around \$150 million in the early 1990s.<sup>17</sup> Using the rule of thumb that the marketing expense is around 15% of sales, around \$30-50 million is spent each year on marketing commercial infant food in competition with breastmilk and breastfeeding. Including foods and juices and other related food products marketed for babies and toddlers, it could be expected that the marketing budget is twice that level at around \$100 million a year in Australia. This marketing expense is tax deductible for companies.

For 'Mothers Milk Incorporated',

'There is no level playing field in the market for infant food. Commercial advertising and promotion of infant foods means mothers' milk is under-rated in the infant food market. Consumers will tend to buy too much commercial baby food because it is 'under-priced' in a social sense, that is when its true costs to society and individuals are taken into account. The implication is that the market price of commercial baby foods and formula does not reflect its true economic cost. Without public action to protect it from unfair competition, breastmilk cannot compete in the market in the long run. The economic and financial viability of Australian hospitals operating human milk banks is also undermined.'<sup>17</sup>

It is well established in economic theory that for markets to efficiently allocate resources, certain preconditions must be satisfied. Central to the assumption of market efficiency is that the consumer makes informed, rational choices, and bears the full costs and benefits of their consumption decisions. That such conditions are not satisfied in the case of some products, for example, tobacco use, is well accepted.

The WHO International Code on Marketing of Breastmilk Substitutes states that because of the vulnerability of infants in the early months of life and the risks involved in inappropriate feeding practices (including the unnecessary and improper use of breastmilk substitutes),

'the marketing of breastmilk substitutes requires special treatment, which makes usual marketing practices inappropriate for these products'.<sup>25</sup>

The economic analysis in 'Mothers milk and markets', also highlights the significant 'public goods' and 'externality' aspects of this unusual market, and comments on the information asymmetries or 'agency' problems affecting individual and public decision making. This perspective emphasises that the costs and benefits of breastfeeding do not necessarily impact on the individual who makes the key decisions, and decisions are unlikely to be fully informed or rational as the market model implies. In particular, the mother is the agent for the child.

Infant feeding decisions by the mother are made in a social, cultural and institutional context in which breastfeeding is sexualised and hindered, where maternity facilities, industrial conditions and the workplace are not accommodating of the needs of breastfeeding mothers, and in which mothers often do not have family or peer support for breastfeeding. Most maternity facilities in Australia fail to meet the WHO/UNICEF evidence based 'Ten Steps' for supporting breastfeeding. Discrimination against mothers breastfeeding in public is notorious and regularly publicised in the media. Only a tiny minority of employed women have access to lactation breaks or paid maternity leave sufficient to properly establish breastfeeding. Survey evidence suggests some mothers may stop breastfeeding to encourage other family members to share more fairly in the care of the infant.<sup>v</sup> Less publicised social barriers to breastfeeding are the power relationships between men and women which result in pressure on some women to wean, as their partners view the infant's access to the breast as competing with their own sexual access to the mother. In short, some women are not free to choose to breastfeed.<sup>17</sup>

Much cultural knowledge of the health risks of artificial feeding, and the proper skills for breastfeeding are based on inaccurate, and in some cases, commercially biased information on breastfeeding from two or three decades ago. All health professionals working with mothers have a professional responsibility to keep up to date on breastfeeding and breastfeeding management from sources without a commercial vested interest, so they can

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<sup>v</sup> Julie P. Smith, Lindy H. Ingham, and Mark D. Dunstone, *The Economic Value of Breastfeeding in Australia*, (National Centre for Epidemiology and Population Health), Australian National University, Canberra, 1998.

enable the patient to make an informed choice. However, even health practitioners are not necessarily well informed, and are susceptible to commercial pressures affecting the infant feeding decisions of their clients.

Evidence from other countries is that maternity care providers have poor knowledge of breastfeeding and are often ignorant of their professional ethical responsibilities under the WHO Code.<sup>26</sup> Our recent quantitative analysis of information provided to health professionals revealed that the titles and abstracts for scientific publications on infant feeding research systematically downplay findings of health risks associated with formula feeding.<sup>27</sup> Health professional conferences on infant feeding are regularly sponsored or organized by infant food companies, who have a clear conflict of interest in this role. This highlights the importance and urgency of independent, high quality training and ongoing education in breastfeeding and breastfeeding management for health professionals, along with promotion of appropriate ethical practice guidelines in this area.

An implication of an unsupportive context for decisions on breastfeeding is that the mother may be pressed to act contrary to the interests of the infant. The ultimate 'consumer' is the baby, but the mother or caregiver, as 'agent' for the baby, may not properly reflect the infant's preferences or 'willingness to pay' in her decisions. In economic jargon there is a 'principal/agent' problem, which challenges the assumption that consumer choice results in economic efficiency. Especially where institutional frameworks including labour market policies do not accommodate the needs of the breastfeeding mother, the interests of the child may not always align with the interests of the mother, and the costs of a decision are not necessarily borne by the individual making the decision.

Acknowledging this dilemma, Galtry<sup>35, 58-60</sup> urges that the adverse impact on child health of premature weaning be recognised in the formulation of childcare, maternity leave and labour market policies.

#### *Commercial marketing*

Infant feeding choices may not reflect those of a fully informed and rational consumer, and there is evidence that they respond to commercial marketing.

Above I outlined the links between declining breastfeeding rates in Australia from the 1950s and increased advertising, promotion and use of commercial breastmilk substitutes. Internationally there is also evidence for strong commercial impact and influences on parents choices regarding drinks for infants and toddlers, especially in areas of social and economic advantage.<sup>28</sup> The GAO report to the US Congress summarized these marketing strategies, which target medical practitioners as well as mothers, and include sponsorship of medical conferences and research.<sup>24</sup> In the US, government welfare programs providing formula to poor mothers are an important marketing strategy for companies,<sup>29</sup> which in 2006 was found by the US Government Accounting Office (GAO) to cause reduced breastfeeding among recipients.<sup>24, 30, 31</sup> GAO data showed mass media advertising of formula has increased considerably in recent years, to protect market share from US government campaigns to promote breastfeeding. The GAO estimated mass media advertising promoting formula amounted to US \$223 million between 1999 and 2004.

The GAO report also concluded from what evidence there is, that marketing was effective; breastfeeding was lower amongst women receiving formula samples in discharge packs, which is one of the marketing strategies that companies used to reach mothers through the medical community. Specialist formulas (such as those supplemented with various fatty acids) are another marketing strategy used to increase price and maximize profitability of formula sold through this program.<sup>29</sup>

In the UK found a recent survey found that manufacturers in that country were finding ways around regulations banning promotion of infant formula, with 2 in 3 mothers recalling infant formula advertising, and around a third of mothers saying the advertising conveyed that formula was as good as or better than breastmilk.<sup>32</sup>

'Mothers' Milk Incorporated' on the other hand, has no comparable access to multimillion dollar revenues to finance its breastfeeding market and promotion expenses. Breastpumps are taxed by the GST, rather than exempted like manufactured baby food and dairy equipment and corporate marketing expenses. The small amounts governments spend on breastfeeding promotion pale into insignificance alongside the marketing budgets of competitors to Mothers Milk Incorporated.<sup>vi</sup>

The economic significance of these personal and structural incentives undermining breastfeeding should not be underestimated.

'With its [potential] value estimated at around \$5.7 billion per annum, the economic costs of declining mothers' milk production are very large. In short, inadequate knowledge of risks of artificial feeding allows the market for mothers' milk to be spoiled by inferior substitutes; a level playing field for breastfeeding means decisions must be based on informed choice about health risks; even informed choices may not be optimal because health costs and benefits of breastfeeding fall on different groups so the incentives may be wrong; choices are not informed because the sophisticated marketing efforts of breastmilk's market competitors are not counterbalanced by a 'Mothers' Milk Incorporated'; and; excluding breastmilk from economic statistics distorts economic policy against women and children.<sup>17</sup>

#### *Making a market for mothers' milk*

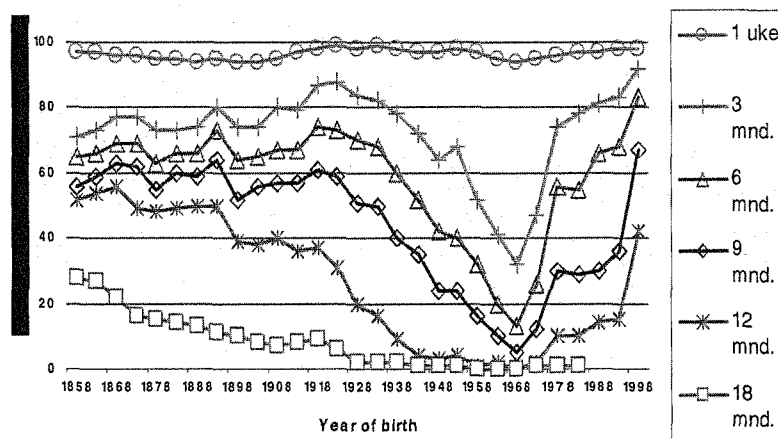
Breastfeeding rates in Northern Europe declined similarly to in Australia from the 1950s. There, governments responded to community concerns about the problem, showing strong leadership during the early 1970s.<sup>33</sup> Working closely with breastfeeding mothers' groups, paid maternity leave was extended, and the WHO Code on Marketing of Breastmilk Substitutes implemented. Mothers' milk is reported in national food production statistics.<sup>34</sup> A recent nationwide effort to make all hospitals achieve BFHI standards has resulted in further increases in breastfeeding. In Norway now, around 80 per cent of mothers are still breastfeeding at 6 months, and virtually all leave hospital breastfeeding. Just under half are still breastfeeding at 12 months. This has been achieved notwithstanding very high rates of labour force participation of mothers.<sup>35</sup> According to Dr Helsing, these trends in Norway reflect the following factors;

- Late 1950s/early 1960s – mothers' groups 'advocacy and support for breastfeeding
- Early 1970s - government funding to breastfeeding support groups, WHO Ten Steps to Successful Breastfeeding formulated and widely read
- Late 1980s - BFHI fully implemented in Norway

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<sup>vi</sup> Furthermore, non-profit organizations such as the Australian Breastfeeding Association rely on mainly female volunteer labour which is increasingly scarce, because of the same competition for the time of women. In one sense 'Mothers' Milk Incorporated' also has to compete with government agencies for its 'customers', with many well intended attempts (such as free breastfeeding classes, or clinic based mothers groups) to provide mothers with support, reducing the number of mothers willing to pay for its breastfeeding classes or membership, and resulting in fewer mothers accessing the community based, skilled and experienced mother-to-mother support needed for breastfeeding. This public sector 'competition' for mothers' time and attention, also has flow on effects, potentially reducing the ability of 'Mothers' Milk Incorporated' to recruit its volunteer workers and provide mothers with support and information resources on breastfeeding.

- 1990s – substantial rise in maternity leave weeks from 20 to 40 weeks



**Figure 5: Historical trends in Breastfeeding in Norway**

**Source: Dr. E. Helsing, pers. comm. 2006**

Most recently, a National Breastfeeding Competency Centre has been established to coordinate policy development, organize breastfeeding promotion and media activities, train and resource health professionals, and administer the BFHI in Norway.

A similar pattern is evident in Sweden. According to the Swedish Statistics Office, the sharp decline in breastfeeding between the mid 1950s and the 1970s was due to the hospitalization of births during this period.<sup>36</sup>

As well as this successful experience of effective public policy in Northern Europe, there is also recent evidence that committed governments can bring about large changes in breastfeeding practices in relatively short periods of time. For example,

- In Chile between 1993 and 2002, exclusive breastfeeding for 6 months increased from 16 to 43.1% and predominant breastfeeding from 25.4 to 57.4%, after the government made breastfeeding a national health priority and introduced a range of measures to implement this policy.<sup>37</sup> Rates of breastfeeding in 12 to 18 month old children also doubled, to around 50%.
- A large multicentre randomized trial of a breastfeeding promotion intervention, modeled on the WHO/UNICEF Baby-Friendly Hospital Initiative (BFHI), resulted in infants from the experimental sites being significantly more likely to be breastfed (to any degree) at 3, 6, 9, and 12 months and far more likely to be exclusively breastfed at 3 months (43.3% vs 6.4%).<sup>38</sup>

A number of governments have moved to address the burgeoning health system cost burden with action plans on breastfeeding. These include the US and New Zealand.<sup>39, 40</sup> The European Commission is also moving in this direction.<sup>41-43</sup> The European *Charter on Counteracting Obesity* was adopted in November 2006 and included 'promoting breastfeeding' in a package of 'essential preventative actions'; these included breastfeeding friendly hospital practices, adequate paid maternity leave and regulation of infant food marketing, as well as health professional training, and support for mothers.<sup>44, 45</sup>

### Health system sustainability

Australia along with many other countries faces a growing problem of obesity, and associated rise in the incidence of chronic disease. Chronic disease is costly to treat, and

difficult to prevent. Australian health expenditures on chronic disease amount to \$20-30 billion a year.<sup>46</sup>

Addressing this problem requires a range of strategies targeting adults and children, diet and exercise. However, effective measures to increase breastfeeding of infants is an essential underpinning of any viable approach to containing and reduce unsustainable future health costs. A separate submission with Dr Harvey reviews epidemiological evidence on the increased obesity and chronic disease risks associated with having been formula fed in infancy.

Based on epidemiological studies of the later life chronic disease risk associated with formula feeding in infancy, some 11-28% of the treatment costs of such major disease categories could be avoided if breastfeeding were increased.

**Table 1: Health expenditures on chronic disease**

Health expenditures 2001, \$ billion	
cardiovascular	5.5
nervous system disorders	4.9
musculoskeletal conditions	4.6
injuries	4
respiratory diseases	3.7
mental disorders	3.7
oral health	3.4
neoplasms	2.9
diabetes	0.8
<b>Total</b>	<b>33.5</b>

Source: *National Chronic Disease Strategy 2005*, Table 1, p.3

Although this is a relatively new research field, evidence is accumulating rapidly on health system savings from reducing chronic disease risk via improving breastfeeding in infancy. For example,

- a UK research team<sup>47</sup> suggest breastfeeding could prevent 3,000 coronary heart disease events and 2,000 strokes annually among those under the age of 75 years in the UK because of the **higher blood pressure** associated with formula feeding in infancy.
- A large study of 596,122 babies born in England and Wales in 2002 estimated that 33,100 **asthma** cases, 2655 **coeliac disease** cases, and 13639 cases of **obesity** arising over 7-9 years were directly attributable to formula feeding and potentially avoidable by breastfeeding. With this **population disease burden** so high, substantial cost savings could be expected from increasing breastfeeding<sup>48</sup>.
- In the United States obesity experts estimate formula feeding is responsible for between 15 and 20 per cent of **obesity** (i.e. the population attributable risk proportion')<sup>49</sup>.
- Additional health care costs for **insulin-dependent diabetes mellitus (IDDM)** in formula-fed children are estimated at US\$1.1-1.3 million a year<sup>50</sup>.

Potential health system cost savings from reducing premature weaning are large.

Furthermore many interventions to reduce obesity and related chronic illness are expensive but are not sustained, whereas breastfeeding has lasting effects over the long term<sup>51</sup>. This makes it likely to be a cost effective preventative health care measure.

An epidemiological study by an Australian researcher shows later life special education costs associated with formula feeding of pre-term infants are also potentially very high.<sup>52</sup>

Health cost impacts of formula feeding on common childhood and infectious illness are well documented. Several studies in developed countries like Australia have identified substantial short term health or hospitalization cost savings from reducing premature weaning. For example,

- A study by the Economic Research Agency of the US Department of Agriculture found that it costs that nation \$3.6 billion each year to treat diseases and conditions such as **necrotising enterocolitis, respiratory illnesses and gastrointestinal illnesses** which are preventable by breastfeeding.<sup>53</sup>
- A recent Italian study showed lower health care costs during the first year of life (due to **fewer hospital admission and ambulatory care episodes**) for breastfed infants compared to those not fully breastfed at 3 months.<sup>54</sup>
- Health care funds could achieve substantial savings by supporting and promoting exclusive breastfeeding. Formula feeding cost US health management organisations an extra \$331-\$475 per formula fed infant for **lower-respiratory illness, otitis media, and gastrointestinal illness**. Hospitalisation costs for lower-respiratory infections were \$26,585-\$30,750 higher among 1,000 never-breastfed babies than for 1,000 exclusively breastfed infants.<sup>55</sup>

Similar results have been found in Australia

- research that I and colleagues at the Canberra Hospital conducted in the ACT showed that by exclusively breastfeeding infants, national hospital system costs could be reduced by \$60-120 million a year based on fewer admissions for **respiratory, gastrointestinal and digestive system illness**.<sup>56</sup>
- Using the ACT study as basis, a study by the Centre for Public Health Nutrition for the NSW Department of Health concluded potential savings for the State's hospital system of around \$25 million a year.<sup>57</sup>

The magnitude of potential health system savings from maintaining breastfeeding to 6 months suggests that health system management needs to collect more information on breastfeeding, and the factors that lead to introduction of formula before hospital discharge and the early postnatal weeks.

For example, attention generally focuses on the high health system cost of 'adverse events' associated with surgery, such as for cardiovascular conditions. However, our research in the ACT suggests the costs of re-hospitalisation and health care associated with newborn infants who are not enabled to establish breastfeeding or breastmilk feeding in the early postnatal weeks may be as high as for surgical 'adverse events'. Whether low exclusive breastfeeding rates on discharge should be considered as an 'adverse event' from the viewpoint of future health system costs needs to be investigated further.

### Conclusion and policy implications

The healthcare system and the food industry, and not just individual mothers' choices, have contributed to poor infant nutrition and obesity trends in Australia. Redressing healthcare system and industry practices to restore a supportive environment for breastfeeding is thus a necessary element of the public health response to the current obesity problem.

In the light of findings from the natural and social sciences about,

- the specificity of milks for young mammals;

- early brain development and the role of breastmilk and suckling;
- evident differences in the health and development of breastfed and infants raised on manufactured infant milk products;

it is clear that premature weaning has profound consequences which translate into higher health costs and lower national productivity

Asking about the health benefits of breastfeeding is thus akin to asking why the Red Cross uses human blood when a cheap supply of surplus blood is readily available from the meat and livestock industry.

Breastfeeding and human milk is the biological norm for human infants. In recent decades it has not been the cultural norm.

National leadership is needed to reverse this situation in order to maintain a sustainable health system and avoid the loss of this unique and invaluable food source. Evidence is that with political will this can be done.

Clearly no-one would wish to compel mothers to breastfeed. If the culture is not supportive, mothers may choose to formula feed believing that this is best for them and their baby. No-one else can make that judgment for them.

Yet evidence from northern Europe and other countries is that **mothers will choose to breastfeed and continue breastfeeding if governments are willing to play a lead role in removing barriers to breastfeeding** - through requiring **breastfeeding friendly hospital practices** including **health professional training and education** and **milk bank facilities**, providing for **paid maternity leave** and ensuring **unambiguous messages** about the desirability of breastfeeding and breastmilk as the normal way to nourish an infant.

#### Responses and recommendations

- require all hospitals receiving Commonwealth funding to achieve Baby Friendly Hospital Status as part of Health Agreements with the States, and
- require monitoring of partial or complete formula feeding rates at hospital discharge as potential 'adverse events', which indicate poor quality of maternal and infant care
- facilitate development of milk banks and wet nursing for babies without access to their own mothers' milk
- recognise mothers' milk production in food statistics and GDP
- require health funds to encourage breastfeeding, such as through reimbursing costs of breastfeeding education classes, ABA membership, and lactation consultants services
- match dollar for dollar the marketing and promotion spend of the infant food industry through public funding of social marketing campaigns promoting breastfeeding as the norm for infants (and/or place effective limits on marketing and promotion of any foods and drinks products which displace breastfeeding of infants and toddlers).
- ensure all infant and toddler food labeling and information material conveys current health recommendations for 6 months of exclusive breastfeeding with ongoing breastfeeding to at least 12-24 months and beyond.<sup>2,3</sup>
- provide public funding to publicise through the mass media the availability of skilled and experienced mother-to-mother support for breastfeeding via the Australian Breastfeeding Association's national helpline and local mothers groups.



- provide incentives to doctors and other health professionals involved in care of mothers and infants to undertake training and education on breastfeeding management and on professional ethical obligations under the WHO code
- provide Medicare rebate incentives to GPs to encourage and support their clients to breastfeed, as is currently done for vaccination
- protect breastfeeding investments against parental time and financial pressures by providing 6 months paid maternity leave
- educate and encourage employers to provide breastfeeding friendly workplaces for all new mothers

## APPENDIX 1

**Smith, JP**, Formula for fatness: infant food marketing in Australia. In: Dixon J, Broom D, eds. *The seven deadly sins of obesity*. Sydney: University of New South Wales Press, 2007.

Explores the history of infant feeding practices & 'industry production' (i.e. by mothers and manufacturers) trends in Australia, including the effects of commercial marketing, hospital practices and labour force competition for mothers' time.

**Smith JP**. The contribution of infant food marketing to the obesogenic environment in Australia. *Breastfeed Rev* 2007 (in press).

Obesity has been growing rapidly among both children and adult Australians in recent decades, raising concern at the associated chronic disease burden, and generating debate over the extent of individual versus government responsibility. This paper briefly reviews recent scientific evidence on links between poor early life nutrition and obesity in later life, which suggests that artificial baby milk rather than breastfeeding in infancy is associated with a 30–50% higher likelihood of later life obesity. It then presents data on long-term trends in breastfeeding in Australia and on consumption of infant milk products since 1939. Evidence is also presented of increased marketing and promotion of breastmilk substitutes from the mid 1950s – including through the healthcare system - associated with the emergence of increased competition in the Australian infant food industry. This collaborative marketing effort by industry and health professionals in turn contributed importantly to the sharp decline in breastfeeding from the mid 1950s. As a consequence, most Australians born since 1955 were exposed to artificial baby milk in early infancy. A substantial proportion of Australian infants are still partially fed with artificial baby milk in the first 12 months of life. The example of infant food highlights that the healthcare system and the food industry, and not just individual mothers' choices, have contributed to poor infant nutrition and obesity trends in Australia. Redressing healthcare system and industry practices to restore a supportive environment for breastfeeding is thus argued to be a necessary element of the public health response to the current obesity problem.

**Smith J**. The 'Voldemort' of Infant Feeding. Paper presented to Australian Lactation Consultants Association conference, 27-29 October Melbourne Park, Melbourne Victoria, 2006.

Mothers' milk and breastfeeding competes in a market against commercial products. Efficient functioning of markets requires, among other things, that consumers can make choices based on full information. A body of Australian law deals with consumer rights not to be deceived or misled by providers of goods and services. International law embodies children's rights to adequate food and health. This paper combines legal and economic approaches to the question of informed choice in infant feeding, and conducts empirical investigation to address the question of 'Why mothers are not told the truth about infant formula'. We conduct a systematic analysis of international research cited by the American Academy of Pediatrics statement on human milk and breastfeeding,<sup>61</sup> on the health risks of not breastfeeding. This analysis shows a 'Voldemort effect'. That is, even where research shows artificial feeding increases health risks, the researchers systematically do not mention the association of artificial feeding with increased illness and morbidity, and frequently messages about the research mislead readers by associating breastfeeding with the illnesses. Formula is very rarely named as a risk factor for various illnesses. It would seem that, just as Voldemort in the popular Harry Potter story was hardly ever named because of fear of attracting attention, researchers fear naming infant formula as a cause of ill health. We argue the need for vigilance in ensuring that researchers clearly communicate their findings about the health risks of artificial infant feeding. This is needed so mothers and their health

professional advisors can exercise informed choice on infant feeding. We also conclude there is a need for legal remedies for mothers kept in the dark about the risks of consorting with 'He Who Must Not Be Named'.

**Smith JP**, Ellwood M. Where does a mothers' day go? Preliminary estimates from the Australian Time Use Survey of New Mothers, International Association of Time Use Researchers annual conference, Copenhagen Denmark, 2006.

This paper reports the results of a unique and novel time use survey of new mothers to estimate time costs of breastfeeding. It showed that mothers breastfeeding according to NHMRC recommendations spend 16-17 hours a week breastfeeding for the first 3-6 months, along with additional 'emotional' care hours of 6-11 hours a week. The high time cost of breastfeeding is surprising. Also 'emotional care' time appears to show dose-dependent link to breastfeeding intensity. This points to the possibility that the process of breastfeeding encourages mothers to interact with their infants intensively, pointing to a possible new causal pathway explaining cognitive and other developmental differences between formula fed and breastfed infants.

**Smith, JP & LH.** Ingham 'Mothers' milk and measures of economic output', *Feminist Economics*, vol. 11, no.1, March, 2005, pp. 43-64.

Thoughtful economists have long been aware of the limitations of national accounting and GDP in measuring economic activity and material well-being. This critique of the current national accounting treatment of human milk production argues for incorporating human milk as an economic output within the ambit of the national accounts system & measures of Gross Domestic Product (GDP). Feminist economists criticize the failure to count women's unpaid and reproductive work in measures of economic production. This paper examines the treatment of human milk production in national accounting guidelines. It also conceptualises mothers' capacity to breastfeed as a national capital asset yielding future flows of economic output valued at around \$37 billion. Human milk is an important resource produced by women. Significant maternal and child health costs result from children's premature weaning onto formula or solid food. The investment of maternal time in human capital formation affects the quality of the national capital stock. While human milk production meets the standard national accounting criteria for inclusion in GDP, current practice is to ignore its significant economic value and the substantial private and public health costs of commercial breastmilk substitutes. Economic output measures such as GDP thus are incomplete and biased estimates of national food production and overall economic output, and they distort policy priorities to the disadvantage of women and children.

**Smith, JP**, 'Mothers' milk and markets', *Australian Feminist Studies*, vol. 19, no.45, November, 2004, pp. 369-79.

This analysis of the 'market' for mothers' milk explores the implications of viewing infant feeding in the context of exchange, and as a 'consumer' decision. It conceptualises breastfeeding as operating in a market, where 'market failure' is pervasive; where mother's milk competes with commercial breastmilk substitutes with a substantial promotion budget, and where lack of a 'level playing field' has adverse implications for breastfeeding. It highlights the significant 'public goods' and 'externality' aspects of the 'market' and information asymmetries or agency problems affecting individual and public decision making.

**Smith, JP**, J Thompson, D Ellwood, 'Hospital system costs of artificial infant feeding: Estimates for the Australian Capital Territory', in *Australian and New Zealand Journal of Public Health*, vol. 26, no. 6, 2002, pp. 543-551.

This collaborative research with The Canberra Hospital made **innovative use of epidemiological method** to estimate attributable hospitalisation costs of premature weaning. It is cited in the 2003 NHMRC *Dietary Guidelines for Children and Adolescents*, and the 2006 *NSW Health* policy statement on breastfeeding. The aim of this paper was to estimate the attributable ACT hospital system costs of treating selected infant and childhood illnesses having known associations with early weaning from human milk. We identified relative risks of infant and childhood morbidity associated with exposure to artificial feeding in the early months of life versus breastfeeding from cohort studies cited by the American Academy of Pediatrics in 1997 as establishing the protective effect of breastfeeding. Data for ACT breastfeeding prevalence is assessed from a 1997 prospective population-based cohort study of 1295 women. ACT Hospital Morbidity Data and DRG treatment costs were used to estimate the attributable fraction of costs of hospitalization for gastrointestinal illness, respiratory illness and otitis media, eczema, and necrotising enterocolitis. We found that although initiation rates were high (92%) less than one in ten ACT infants are exclusively breastfed for the recommended 6 months, mainly due to supplementation or weaning onto formula within the first three months, and the early introduction of solids by breastfeeding mothers. This study suggests the attributable hospitalization costs of early weaning from breastmilk in the ACT are around \$1-2 million p.a. for the five illnesses. We concluded that early weaning from breastmilk is associated with significant hospital costs for treatment of gastrointestinal illness, respiratory illness and otitis media, eczema, and necrotising enterocolitis. These costs are minimum estimates of the true cost of early weaning as they exclude numerous other chronic or common illnesses, and out-of-hospital health care costs. Higher rates of exclusive breastfeeding would reduce these costs. Interventions to protect and support breastfeeding are likely to be cost-effective for the public health system.

**Smith JP**, Ingham LH. Breastfeeding and the measurement of economic progress. *Journal of Australian Political Economy* 2001; 47:51-72.

This paper examines the treatment of human milk production in international standards for national accounting and in Australian national accounts, and shows that human milk meets the criteria for inclusion in Australia's GDP. It then sets out the process for appropriately adjusting the national accounts to incorporate human milk supply, and externalities associated with infant feeding method. Using previously published estimates of the economic value of human milk supplied in Australia for 1992, we show that economic gains from increased breastfeeding are substantial compared with gains from recent major microeconomic policy reforms. We also estimate the capitalised value of Australia's human milk production capacity, conceptually integrating our estimates of human milk production with the building block for national accounting, the nation's capital stock.

**Smith, JP**, 'Human milk supply in Australia', *Food Policy*, vol. 24 (1, May) 1999, pp. 71-91.

This publication on the economic value of breastfeeding provides the **first systematic economic analysis** of the value of human milk and breastfeeding using a conventional economic accounting and analytical framework, and the **first estimates of the value of human milk produced in Australia**. This paper sets out to place a monetary value on the actual and potential supply of human milk in Australia. It estimates the quantity of milk produced in 1992. It considers different bases for determining a 'shadow price' for breastmilk, and uses the method established in Oshaug and Botten (1994). It also calculates scenarios for different prevalences of breastfeeding, looking at the implications for human milk supply of Australia achieving its National Health Targets, of all mothers breastfeeding according to the optimum regime recommended by the WHO and UNICEF in the Innocenti Declaration of 1990, or of a return to the 'human milk famine' of the early 1970s. It

concludes Australian women supplied 33 million kg of breastmilk in 1992, compared to 16 million kg in 1972. Valued at A\$67 per litre, the price of expressed human milk, the 1992 production level was worth \$2.2 billion. This is around 0.5 of GDP, or 6% of private spending on food. Achieving international standards for 'optimal' levels of breastfeeding, with breastfeeding continuing to age two and beyond, would nearly triple the supply of human milk.

**Smith JP**, Ingham LH, Dunstone M. The economic value of breastfeeding in Australia. Australian National University, Canberra: National Centre for Epidemiology and Population Health, 1998.

In recent years a substantial body of research has focussed on extending conventional measures of the economy such as Gross Domestic Product or National Income to include the household economy, including unpaid work, or the costs of environmental degradation and depletion of natural assets. Such estimates can be important to provide a more meaningful and accurate basis for public policy, and better appreciation of the relative contribution of individuals to community welfare. Including human milk in measures of economic production would make this politically invisible food visible, and would assist in promotion of breastfeeding. It is also positive recognition of one of women's unique contributions to society. As human milk production is excluded from GDP, while artificial formula is included, increased breastfeeding reduces measured economic growth. This is clearly nonsense and misleads policymakers. As this paper shows, there are substantial economic gains to the community from breastfeeding, and huge economic losses from artificial feeding. Omitting human milk production from measures of national output and Gross Domestic Product (GDP) is also inconsistent with the United Nations System of National Accounting (UNSNA). This paper considers the issue of the economic value of breastmilk and breastfeeding. Our objectives were to:

- estimate the actual food production value of human milk in Australia, and the value under different breastfeeding scenarios, such as meeting World Health Organisation (WHO) breastfeeding targets;
- incorporate time and commodity cost and health implications of alternative infant feeding methods, to estimate the economic value of breastfeeding in Australia;
- explore how to integrate estimates of the economic value of human milk production into a national accounting framework and GDP, viewing national breastfeeding potential as a natural (human capital) resource asset yielding economic income flows over time.

The first section surveys the literature on the economics of breastfeeding, while the second section estimates human milk production in Australia for 1972 and 1992, and under different scenarios for breastfeeding prevalence. The third section incorporates these estimates into a broad economic framework, which includes the time, goods, and health cost implications of alternative infant feeding methods, and the fourth section explores the implications for national accounting practices. In conclusion, we speculate on the implications of human milk production for the economic reform priorities of Australian governments, and suggested strategies for increasing the extent and economic value of breastfeeding in Australia.

**Smith, JP**, 'The economics of breastfeeding', *Australian Financial Review*, July 29 1997.

This publication generated heavy media coverage and arose from the 1997 conference paper which initiated this research into the economics of breastfeeding.

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