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Accounting for Non-market Household Production from the Perspective of the Most Vulnerable:
20th Century Trends in Human Milk Production as a Cross Cutting Indicator of Well-being and
Sustainability

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There is growing acceptance that GDP is a flawed metric for measuring and tracking economic performance as it excludes the contribution of ecosystems and nonmarket household production to economic wellbeing. Studies extending the production boundary to unpaid household services show GDP growth has significantly overstated economic performance because of shifts from household to market economic activity.

The ‘Beyond GDP’ agenda set out by the SSF Commission in 2009 included broadening income measures to non-market activities. The Commission cited human milk to exemplify the measurement bias from excluding the unpaid household economy:

“There is a serious omission in the valuation of home-produced goods – the value of breast milk. This is clearly within the System of National Accounts production boundary, is quantitatively non-trivial and also has important implications for public policy and child and maternal health”

A decade on, there is improved accounting for environmental asset depletion and degradation. However national accountants remain reluctant to count non-market household production, with attention focussed on unpaid household services. The exclusion of human milk from GDP remains unaddressed, despite its wide ranging ramifications which also exemplify fundamental difficulties facing the national accounting framework post-SSF.

This paper deals with the problem of assessing trends in economic welfare when there are shifts between sectors over time, through focussing on household production/consumption of human milk as an indicator of sustainable economic wellbeing at the most primal level. Expansion of the digital economy reinforces the previously identified need to better measure and understand the blurred boundaries between household and market sectors, and shifts of economic activity between them. Notably, since 2009, human milk has been increasingly bought, sold and exchanged, including internationally, and including by mothers seeking a substitute for breastfeeding on return to paid work (sometimes via social media or the Internet).

Hence the purpose of this paper is to explore economic wellbeing implications of shifts in the locus of nutrition and care production activities since the mid 20th century, from the household to market sourced breastmilk substitutes. It focusses on measuring changes in human milk production for infants and young children ('IYC', 0-3 years) in the USA, Australia and Norway from the early 1900s to the current time. It asks in particular whether the dramatic global decline in human milk supply, identified by World Bank nutrition economists in the 1970s, might significantly impact macroeconomic aggregates in these countries. While a rise in milk formula production and use increases GDP, declining breastmilk production is not counted, and remains invisible in the SNA.

The paper firstly discusses IYC feeding within a capabilities and equality framework. SSF noted that being adequately nourished and escaping premature mortality are 'elementary' in a capabilities approach. More complex capabilities, including those based on literacy, are also reliant on early life nourishment and care that optimises cognitive development. The 'Beyond GDP' agenda therefore is argued to support a strong focus on children's survival, health and development. A focus on IYC is also supported by SSF recommendations for more attention to inequality; infants are those with greatest vulnerability to deprivation and poverty, and least 'agency' regarding how they are fed and cared for, despite this profoundly affecting their capabilities for health and development. As shown by multiple systematic reviews and meta-analyses outlined in this paper, breastfeeding is important to child health, and to child health equity. WHO researchers also cite strong evidence that insufficient breastfeeding in infancy reduces cognitive development, therefore influencing lifetime economic prospects. Notably too, breastfeeding of infants has high time costs for women. Being enabled to breastfeed is therefore also an issue of gender equality, in the context of a significant 'motherhood pay gap' in most countries.

The second section of the paper summarises data on the dramatic and worldwide change in infant feeding practices in the middle of the 20th century. Breastfeeding was the norm until the early decades of the century. Now, commercial breastmilk substitutes dominate the diets of IYC globally. The dramatic declines in breastfeeding in many countries in the 1960s and now in China represent a major shift in the locus of productive activity in the IYC food economy.

Thirdly the paper describes how to assess the economic magnitude of these shifts from unpaid household production of human milk to market production of breastmilk substitutes. Macroeconomic values of human milk at a single point in time are published for several countries. A key question is, how much do previously unmeasured historical shifts affect key macroeconomic aggregates over time. The paper shows how available historical data for breastfeeding and annual births in the selected countries can be used to estimate trends over time in households' production and consumption of human milk. Identifying representative key time points during the 20th and 21st centuries allows historical trends in the economic value of human milk output for the USA, Australia and Norway to be documented using established methods for imputation, within an SNA framework, based on available market prices and/or time use data. In

the fourth section of the paper, results are presented on the lost economic value attributable to reduced human milk output in the countries studied, and compared with key GDP and private consumption expenditure on food, and milk formula.

The economic and environmental sustainability of this dietary shift and diminution of women's breastfeeding capabilities are discussed in the final section. Health economic research has identified large cost externalities of breastmilk substitutes in various countries, including economic and health treatment costs of excess mortality and morbidity. World Bank and WHO researchers recently estimated economic costs of cognitive losses and arising from not breastfeeding to be at least \$300 billion p.a. globally. Production of breastmilk substitutes also has significant environmental costs: a recent WHO LCA study estimates that a kilogram of commercial milk formula produces eleven times that volume in greenhouse gas emissions.

The paper concludes with recommendations for research and time use data collection, and discusses policy implications. In particular it argues for the inclusion of human milk in GDP, and for better time use data on IYC feeding.