



The politics of milk: examining claims about dairy in China

Claims that dairy is “cheap, nutritious, and that its consumption is increasing in China due to rising incomes” are incomplete and based on selective evidence

These claims are very effective for “changing the subject” —they steer attention away from recognizing that most of the benefits from increased production and consumption of industrialized dairy products flow to a tiny minority

Unless these claims are more widely challenged, they may close off possibilities for food systems that are more diverse, more regionally self-sufficient, and less highly processed



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Examining the claims

Introduction

The production and consumption of **milk and dairy products in China** has changed dramatically in the past four decades...



9% per year growth

national per capita dairy consumption increased from **5 kg in 1984 to over 22 kg by 2007**



3rd largest global dairy producer

domestic sources total more than **30 million metric tons**



2 firms now in the top 7 globally

among the top 20 dairy firms in **2007 there were none headquartered in China**



world's largest dairy importer

imports account for **nearly one third of national consumption**



+100,000 cows

at one facility in Heilongjian, near the border with Russia, is the **world's largest dairy**

Although dairy consumption did occur in China historically, in most regions it was typically at very low levels, and often associated with medicinal practices.

These changes have been accompanied by **claims** that have been widely repeated in efforts to explain and justify the reasons why they are occurring. Claims are **short statements that identify and frame problems and/or put forward specific solutions and system trajectories**. Communication based on claims is characterized by clear and simple messaging, bold categories, and the use of a restricted amount of information. This allows for transmitting information quickly, particularly in contexts where there may not be space for additional detail, such as short articles, audios or videos.

Although claims may not be entirely incorrect, their brevity necessarily **obscures complexities and nuances that make them incomplete, while also steering dialogue and action in particular directions**. Those who stand to gain or lose due to the influence of these claims are not always evident, and may even be deliberately hidden.

What are the key claims about dairy in China?

1 “Dairy is cheap”

2 “Dairy is nutritious”

3 “Rising consumer incomes are increasing demand for dairy”



This briefing memo examines the claims that, (1) dairy is cheap, (2) dairy is nutritious, and (3) that rising consumer incomes are increasing demand for dairy. **These claims are made frequently** by dairy industry executives, government officials, investors, and even civil society organizations. They are also widely repeated in mainstream and alternative media sources.

These claims are incomplete, however, as (1) the market price of dairy leaves out numerous costs to people and ecosystems, (2) dairy is increasingly consumed in ultraprocessed forms and is displacing more diverse dietary patterns, and (3) dairy consumption would be lower without widespread and increasingly sophisticated marketing efforts.

Why focus on claims?

Mass media outlets typically do not have space to provide depth and nuance, yet **claims that are widely circulated have the potential to substantially influence policies and outcomes**. The sociologist Joel Best (2013) suggests that problems go through six distinct phases:

1. claims making
2. media coverage
3. public reactions
4. policy making
5. practical implementation of policies
6. policy outcomes.

He notes that this process does not always involve all six of these stages or this exact order. In addition, **challenges to claims may be an important element in the success or failure of the outcomes** preferred by claims makers. **Analyzing the assumptions embedded within claims** is therefore a critical task for achieving policies and outcomes that will reflect the goals of the majority, not just a small minority. Questions that we may ask include:

- *What does the claim imply to be the problem and the solution?*
- *What is the evidence for and against the claim?*
- *What perspectives and data are left out?*
- *Who benefits and who loses?*
- *What other possibilities are being closed off?*

The strategies of powerful organizations often use claims effectively to **“change the subject” and deflect criticism, while legitimizing inequalities** (Freudenberg and Alario 2007). An example is the claim made by many food and agricultural industry executives that food production needs to increase substantially to feed 9 billion people by 2050. This suggests that global food and nutrition security can only be met by simply increasing food production, and diverts attention from the failure of current food systems to eliminate hunger. It also leaves unchallenged micronutrient deficiencies that affect over two billion people.

“ If they can get you asking the wrong questions, they don’t have to worry about the answers.

Thomas Pynchon, *Gravity's Rainbow* (2000)

Although they may not be accepted by everyone, claims such as these may reach a status of being above criticism, taken-for-granted, or deemed obvious by a majority of people, and “being accused of questioning such assumptions can even become a serious allegation,” or a violation of the bounds of discussion (Davidson and Grant 2012). **Even critics may fall into the trap of accepting the assumptions underlying claims, and therefore unintentionally reinforce these problems** (IPES-Food 2022).

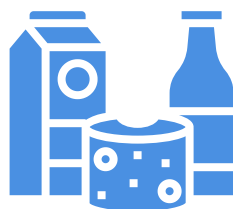
Analyzing the claims and recommendations for addressing their shortcomings

The following sections examine each of these three frequently repeated claims with respect to dairy in China, followed by conclusions and recommendations. The recommendations include policy suggestions, although due to the influence of politically powerful individuals and organizations, implementing them will be extremely difficult in the near future. Therefore, **key short-term recommendations include increasing efforts to point out:**

- **the implicit assumptions and limitations of these and other widely repeated claims**
- **who is gaining power** from accepting them fully

In particular, dominant claims about dairy in China:

- **steer attention away from recognizing that most of the benefits** from increased production and consumption of industrialized dairy products **flow to a tiny minority**
- **may close off possibilities** for food systems that are more diverse, more regionally self-sufficient, and less highly processed



The claim: “dairy is cheap”

1 What is implied as the problem?

Food calories need to be more affordable

2 What is implied as the solution?

Promote calorie dense foods and reduce their prices

3 What is left out?

Hidden costs that are not included in retail prices, such as government subsidies, and social and ecological impacts

“ The greatest efficiency of today’s food system lies not in its technology, economies of scale, or managerial techniques. It lies in its accounting practices. Any system capable of pushing most of its costs onto society, the environment, and future generations will clearly produce a “cheap” product. How could it not?

Michael Carolan, *The Real Cost of Cheap Food* (2018)

The claim that “dairy is cheap” implies a problem that food calories need to be more affordable. This **oversimplifies foods to just calories** or units of energy, and **minimizes their social, cultural and health importance**.

The solution that is implied by this claim is to promote calorie dense foods and reduce their prices for consumers, particularly for milk and dairy products. According to the Food and Agriculture Organization of the United Nations (2022), however, the rate of undernourishment in China in 2020 was less than 3 percent. China’s **national rate of obesity more than tripled between 1993 and 2015** (Ma et al. 2021), which raises additional questions about the need for more cheap calories.

This claim also **steers attention away from numerous hidden costs**, which are not reflected in the retail price of dairy products. These costs include government subsidies, both direct and indirect, as well as social and ecological impacts.

Direct subsidies to the dairy industry in China are extensive, and include grants, tax breaks, preferential treatment from government banks, and exemptions from regulations. These subsidies **provide dairy products with significant advantages in comparison to foods that do not receive such support**. In addition, many dairy policies have been deliberately designed to favor larger scale producers, which has fueled their growth at the expense of smaller operations. One result is that there were more than sixty dairies with 10,000+ cows in China by 2016, a dramatic contrast to twenty years earlier when the average dairy farm had just 3 cows (Wang et al. 2021).

Government policies also target advantages specifically to the top twenty dairy processors, with a subset of these designated as “dragon head” firms to receive even more favorable treatment. The term dragon head refers to the lead dancer in a parade, and these firms are assigned the role of increasing the scale of production, as well as concentrating their industries geographically and in terms of ownership. Firms with this designation are among the few allowed to have foreign investment, such as Danone and Arla acquiring minority stakes in Mengniu Dairy, and Yili Group forming a joint venture with Dairy Farmers of America.

Indirect subsidies include infrastructure for utilities and transportation, **funding** for research that disproportionately focuses on large-scale operations, **and regulations** that place more burdens and significant barriers to entry on smaller products and processors. One example is support for infrastructure for importing feed to China from the United States and Brazil. In the U.S. in recent years, it was cheaper to ship alfalfa hay from Los Angeles to Beijing than from Southern California to Central California (Jervey 2014).

Intellectual property protections and expensive technologies also favor larger firms with significant financial resources. Corporations headquartered in China now lead the world in the number of patents on dairy products. Bright Dairy, for example has 570 patents, more than any other firm globally, and Yili Group is ranked second with 415 patents (Mintel 2020a). Many leading firms are developing patent protected formulas for shelf stable yogurt, which provides a significant advantage in distributing these products through less expensive unrefrigerated supply chains.

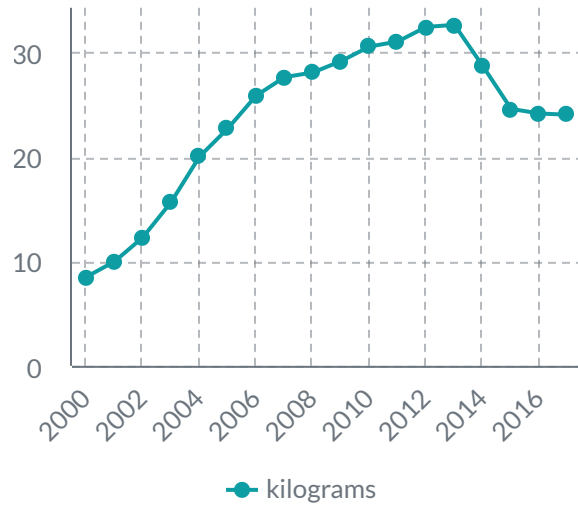
The ecological impacts of increasingly larger and more industrialized dairy systems include resource depletion, pollution and greenhouse gas emissions, particularly the methane emissions from ruminants. China is the world’s largest source of greenhouse gases from agriculture, and over one-quarter are from cows, goats and sheep (You and Schoenmakers 2020). These figures do not include the additional impacts of a more comprehensive “ecological hoofprint” (Gray and Weis 2021), which would also consider the resource needs and pollution impacts of feed crop production and food waste.

Manure management is another significant problem, with **dairy increasingly separated from crop production**—an estimated 40 percent of this waste is not returned to the soil, and is **contributing to eutrophication of surface waters** (Wang et al. 2018). As noted above, much of the feed for dairy cows in China is now imported from other nations, leading to ecological impacts in very distant regions.

Dairy trends in China

While per capita consumption has leveled off in recent years, prices and imports have increased

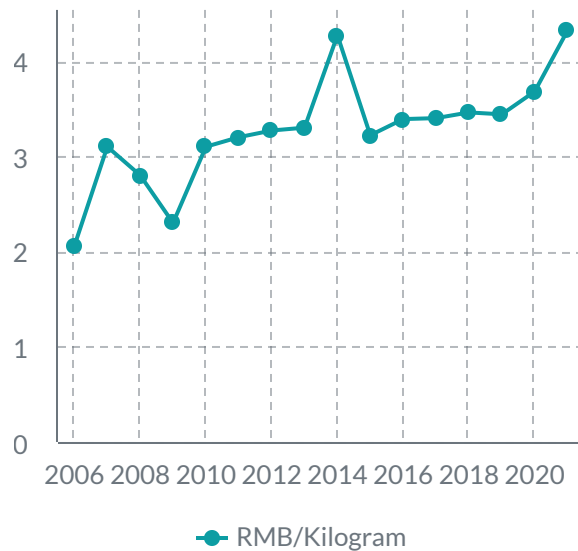
Per capita milk and dairy consumption in China, 2000-2017



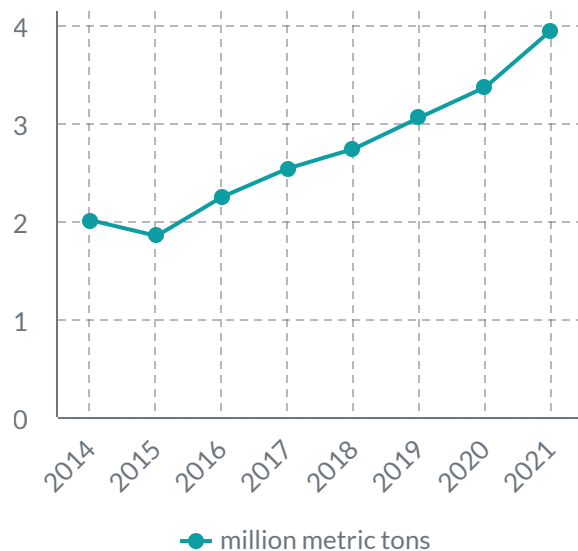
Government support

Government policies have played a substantial role in reducing previous barriers to imports

Price of milk in China, 2006-2021



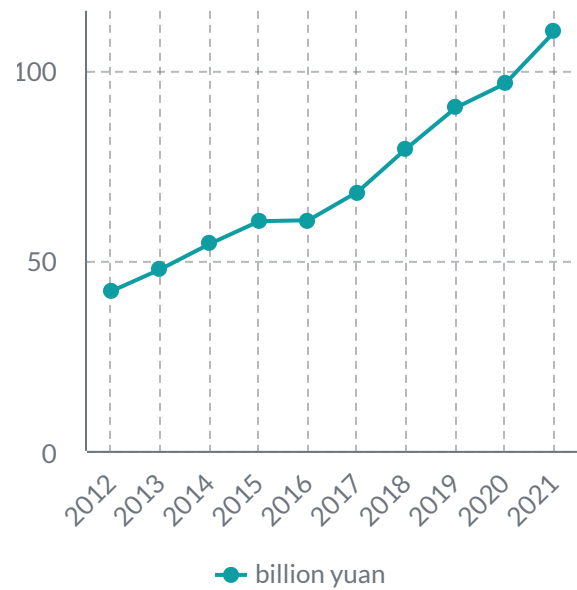
Volume of dairy imported to China, 2014-2021



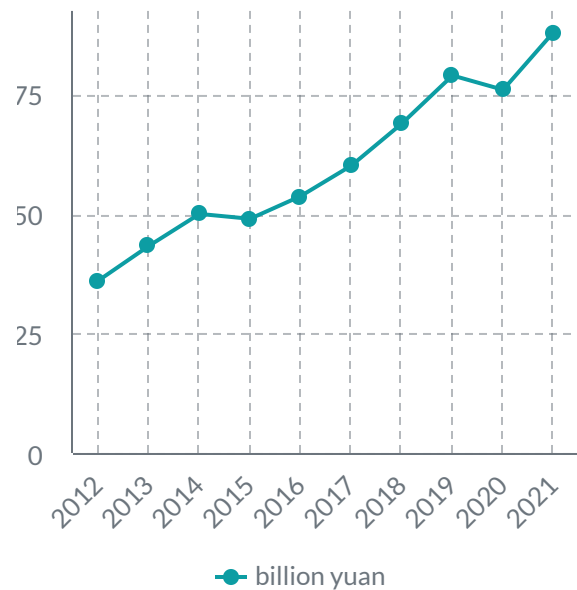
Revenue of leading dairy firms, 2012 to 2021

The largest dairy firms in China have steadily and substantially increased revenues

Yili Group



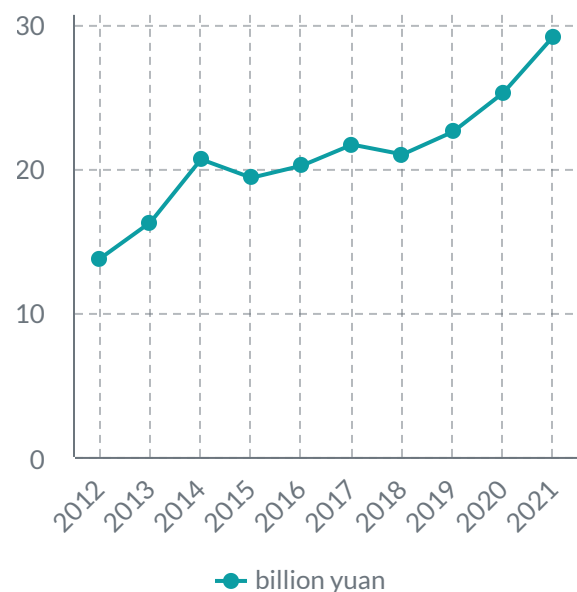
Mengniu Dairy



Investor expectations

The market capitalization values of Yili (\$29.6 B) and Mengniu (\$15.7 B) have surpassed all other dairy firms in the world, despite lower annual dairy sales than Lactalis, Nestlé, Danone and Dairy Farmers of America. This reflects an expectation from investors that these firms will continue to increase their power in the future.

Bright Dairy



An increasingly well-known example of **distant impacts** is the expansion of soy production in Brazil, and its links to **deforestation of rainforests and savannas in Brazil**, with China receiving 75 percent of whole bean exports from this nation by 2013 (Oliveira and Schneider 2015). Approximately 10 to 20 percent of the diets of dairy cows in intensive operations are typically composed of soybeans.

In the U.S., exports of alfalfa hay to China are now at record levels—primarily to feed dairy cows—and **account for 37 percent of national hay production** (Rankin 2022). Much of this alfalfa hay is produced in desert regions in the Western U.S. that are currently experiencing a 22 year long megadrought (Fu 2022). These crops are irrigated with water that is substantially subsidized by governments, despite rapidly depleting reservoirs and record low river levels. This amounted to more than **fifty billions gallons of “virtual water” embedded in alfalfa production** sent to China in 2012 alone (Jervey 2014).

The risks of centralizing production were illustrated by the Covid-19 pandemic, with disruptions to food supplies when outbreaks of illness led to processing plant shutdowns in North America and Europe in 2020. A heavily reliance on imports is also a highly vulnerable strategy, and may be disrupted when chokepoints are closed off, such the obstruction of the Suez Canal for six days in 2021. Another potential source of disruption would be increasing costs for inputs such as fertilizers, fossil fuels, livestock feed, and water—this may occur either as a result of declining supplies, or due to increasing power of those who control these resources.

Decreasing self-reliance is also an impact at regional and household levels. Fewer and larger processors result in dairy farmers having limited options for buyers, and thus greater power to drive down the prices paid to farmers. Lower farmer incomes result in many negative impacts on rural communities, including the loss of farms. In 2019, Xiaoqian Hu asked an informant in a district in Heilongjiang, “what had happened to farmers who were raising cows in the compounds [where 90 percent of local farmers were pushed by a heavily subsidized processing plant to relocate four years earlier]? He replied that most of them had sold their cows, left home, and were working in big cities as migrant workers, and that others had switched to raising beef cattle or hogs. **‘No one raises [dairy cows] any more. It’s all mechanized’**” (Hu 2020, p. 126).

For consumers, **dairy prices in China have been steadily increasing in recent years.** In some cases, the increasing market shares of dominant dairy firms led to price fixing—after a government investigation into foreign manufacturers of baby formula was initiated, the leading firms immediately cut their prices by as much as twenty percent. Six of these firms were later assessed fines totaling more than \$1 billion. As industries become more concentrated, however, efforts to raise prices will require less coordination among leading firms, and will be more difficult for governments to uncover.

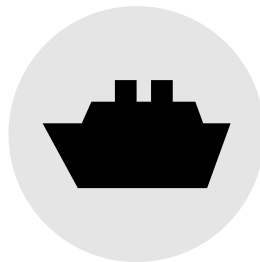
Dairy industry changes have resulted in **substantial increases in the wealth of some top executives and investors.** Executives at Mengniu, Feihe and New Hope, for example, amassed fortunes exceeding the equivalent of one billion U.S. dollars, and others who were already ultra-rich from other industries have acquired foreign dairies or launched domestic brands (see p. 14).

Hidden costs

Numerous impacts are not reflected in prices that people pay for dairy products



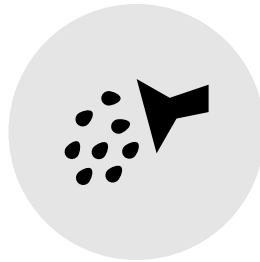
Direct and indirect government subsidies



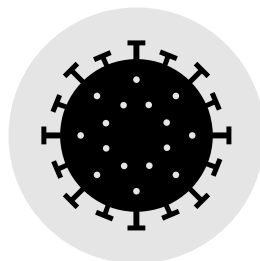
Increasing dependence and less self-reliance at the national, regional and household level



Pollution and greenhouse gas emissions



Depletion of resources, including soil, water, fertilizers and fossil fuels



Increasing risks of disruption from threats, including diseases and climate change

Who pays?

These costs of these impacts and risks fall upon society and ecosystems, now and in the future

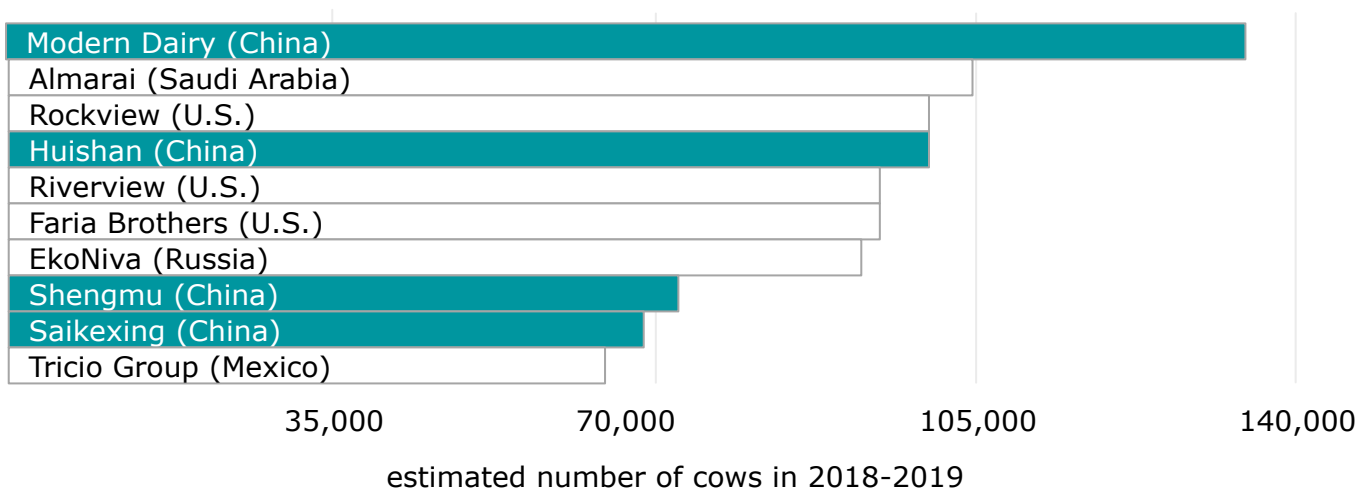
Declining diversity, declining resilience



Holstein cattle are a breed developed in the Netherlands. These cows **produce enormous amounts of milk and are able to tolerate high grain diets**. A tradeoff of this level of milk production is that they are **more fragile than other breeds of milk cows**, including a greater sensitivity to temperature changes. In addition, selecting for the highest amount of milk production has resulted in excessive levels of inbreeding and genetic uniformity for this breed.

Approximately 80 percent of the 6.2 million cows in China in 2022 are Holsteins. This has been aided by government subsidies for the import of hundreds of thousands of cows of this breed each year, primarily from Australia and New Zealand. The **effective population size** for Holsteins in China, however, is estimated to be **less than what would be expected for just 50 animals**, although 100 is considered the minimum for maintaining genetic diversity. These trends are resulting in a loss of resilience, with livestock that are more susceptible to disruption from diseases and climate change. They are also **contributing to the extinction of other breeds of livestock**, such as those that are **better able to thrive on forage rather than grain, or with less management**.

10 largest global dairy farming companies



Firms located in China are highlighted. Note that Mengniu Dairy has majority ownership of Modern Dairy and Shengmu.

Data: Kocic and Hemme 2020

Efficiency for whom?

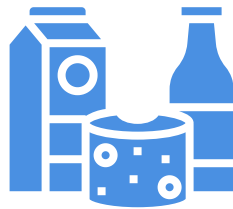
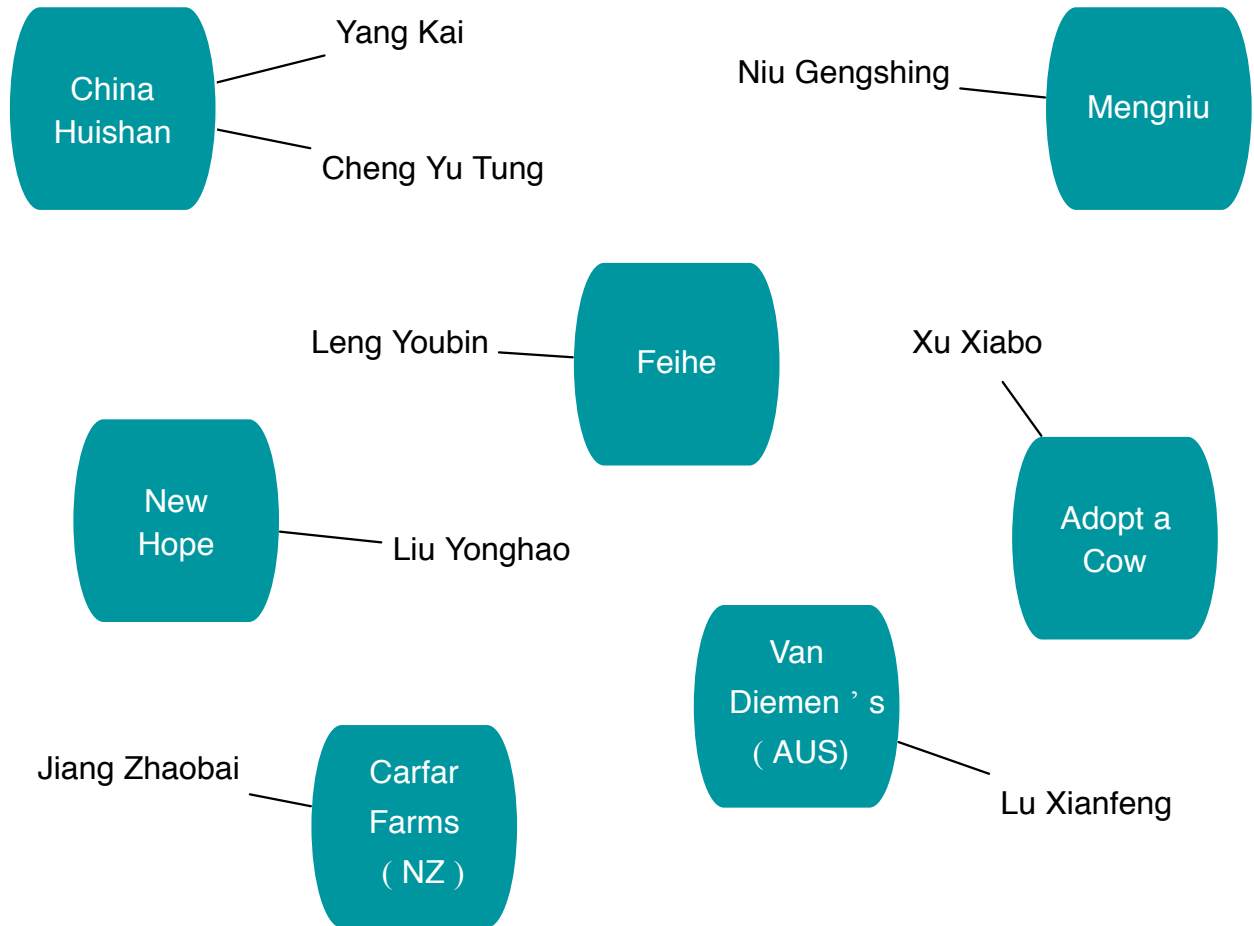


A claim that is frequently made in conjunction with the claim that “dairy is cheap” is that large-scale producers are more “efficient.” **Efficiency** is typically defined very narrowly, however, and **does not reflect the numerous advantages provided to larger-scale operations**. In the United States beginning in the 1800s, for example, state and national governments prioritized the interests of more industrialized dairy producers, and developed regulations that favored their production practices (DuPuis 2002).

The **political efforts** that were organized, and the role of “experts” such as economists in rationalizing them, resulted in a “self-fulfilling prophecy”—it **contributed to the greater success of this scale of operation**, as well as to the **decline of smaller-scale producers**. Ironically, these policy changes were demanded because larger-scale producers did not want to compete against those who could sell their milk for a lower price—smaller farms located on poorer soils had lower input costs and these households were less dependent on outside income for their livelihoods, even if their milk production per cow on an annual basis was lower.

As Melanie DuPuis (2002, p. 208) notes in *Nature's Perfect Food*, this type of “productivist state intervention eventually became the ‘cheap food’ agricultural development policies promulgated by the World Bank and other development institutions.”

Billionaires in China and their connections to dairy firms



The claim: “dairy is nutritious”

1 What is implied as the problem?

Specific nutrients are necessary for human health, particularly protein

2 What is implied as the solution?

Promote increased consumption of foods with protein

3 What is left out?

Deficiency of protein is relatively uncommon, less attention to micronutrients that are not as well studied, the negative health impacts of increasing consumption of dairy products, particularly in ultraprocessed forms

“ The point is not that nutrition science has not yielded valuable insights into the relationships among nutrients, foods, and the body, but that these insights have often been interpreted in a reductive manner and then translated into nutritionally reductive dietary guidelines. This reductive interpretation includes the decontextualization, simplification, and exaggeration of the role of nutrients in determining bodily health.

Gyorgy Scrinis, Nutritionism: The Science and Politics of Dietary Advice (2013)

The second claim, that “dairy is nutritious,” implies that specific nutrients are necessary for human health, particularly the macronutrient of protein. Like the claim that dairy is cheap, it **minimizes the social and cultural importance of food**. It also **reinforces the increasing medicalization of food** and the role of experts in determining dietary patterns, which undermines self-reliance and traditional wisdom.

The solution that is implied by this claim is to promote increased consumption of foods with protein, such as dairy. Protein is critical for human health, but the assumption that most people have daily intakes that are deficient is not well supported. Dominant dairy and meat processors in high income countries ignore the fact that these populations actually consume too much protein on average, and instead promote even greater consumption of the higher-protein foods they sell (Howard et al. 2021). **Nationally, China was estimated to have twice as much protein available to the average consumer in 2010 than was suggested by dietary guidelines** (Nelson et al. 2018).

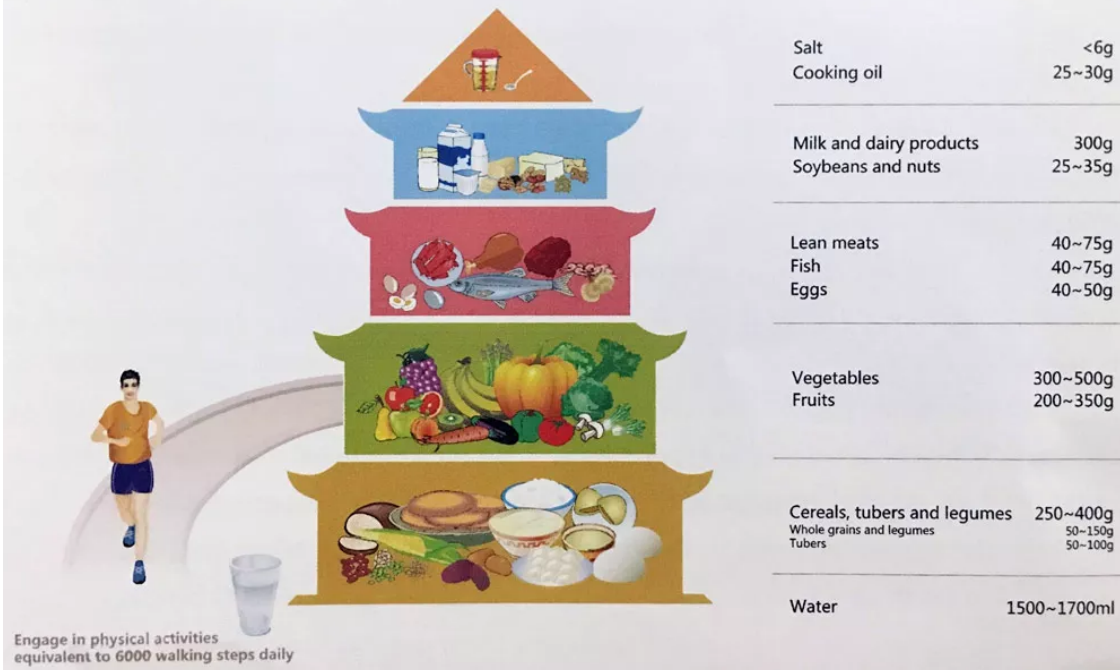
This claim also **steers attention away from** other issues. Some of these include **the importance of micronutrients that are not as well understood**, such as phytonutrients, **and the negative health impacts of increasing consumption of dairy products**, particularly in ultraprocessed forms. Although influential nutrition scientists have typically taken very reductionist approaches in recent decades, an increasing number of experts are beginning to consider foods and beverages as more than just bundles of protein, fat and carbohydrates. Instead, they are examining how the structure, enzymes, nutrients and other components of foods interact with each other.

This more holistic approach has not yet had a substantial impact on national dietary recommendations or dominant dairy firms, however. **Government officials and industry executives continue to promote increased consumption of dairy products**, with little recognition of their level of processing or added ingredients. One example is the introduction of numerous dairy products fortified with nutrients that are not actually in short supply, such as protein. The emphasis on protein has also been communicated extensively to potential consumers, as 49 percent of people surveyed in China reported consuming dairy beverages to increase their intake of this macronutrient (Mintel 2020b).

The government of China's **dietary guidelines were revised** to suggest a recommended intake of milk and dairy products of **300 to 500 grams per day** in 2022, an amount that has increased in nearly every update of these guidelines—even though the lower end of this range is **twelve times the average amount actually consumed**. These guidelines are presented as a “food pagoda,” as shown on page 17. Li and Jamieson (2021, p. 143) note that “In general, the food pagoda tends to reproduce existing trajectories, rather than contradicting them,” and is not based on overwhelming scientific evidence. The political influence of the dairy industry is illustrated by the fact that, “The industrial advocacy group, Dairy Association of China, is housed in an office just one floor under the nation's top dairy research unit in the prestigious Chinese Academy of Agricultural Science (ibid., p. 160). Nutritionists are also receiving an increasing amount of funding from the dairy industry, resulting in what these authors describe as a “food/nutrition policy complex.”

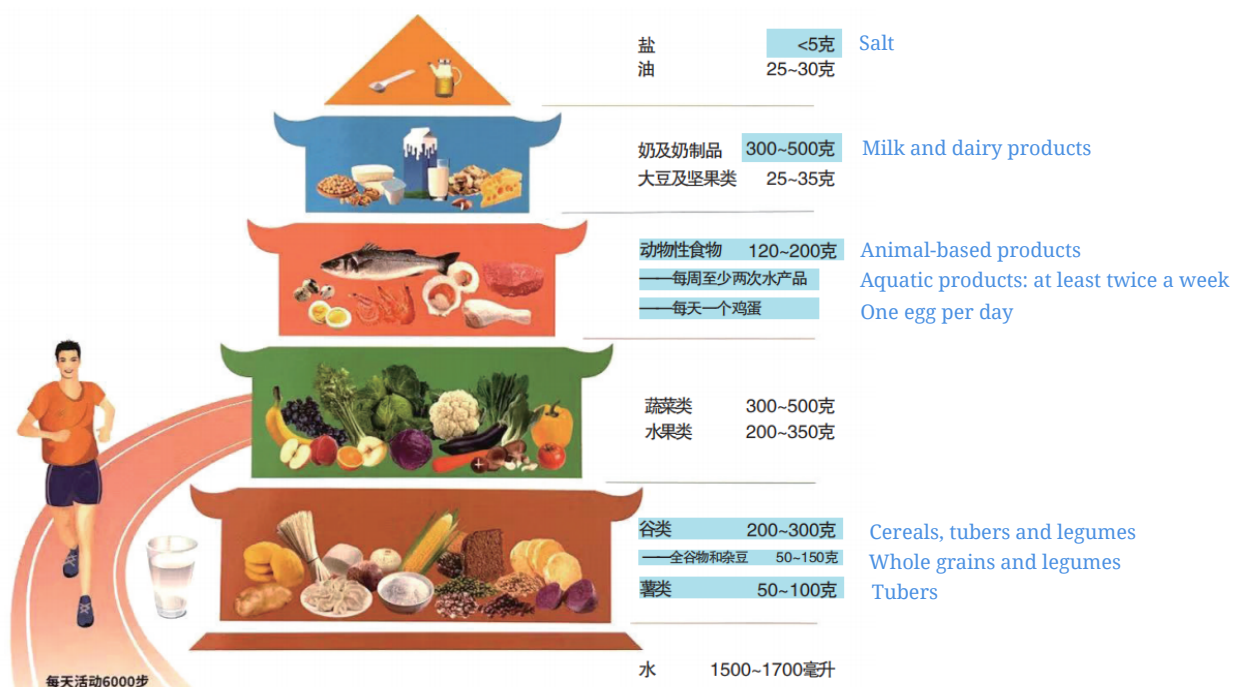
1 Food Guide Pagoda

Chinese Food Guide Pagoda(2016)



Chinese Food Guide Pagoda (2022)

Changes highlighted



中国居民平衡膳食宝塔 (2022)

(图片来源: 中国营养学会)

Dairy industries have also found synergies with increasing trends of medicalization, and **target their products with claims related to specific health issues**—these are sometime referred to as “nutraceuticals.” Some of the new products introduced in recent years include a yogurt drink with lutein and vitamin A for eyes, a milk powder with calcium and sesame seed extract for sleep, milk infused with collagen for enhancing skin, and drinks targeted to seniors for “healthy aging.” These have joined product lines that already emphasize additional fiber and probiotics for gut health, as well as claims related to strong bones and teeth.

The strategy has been effective, as 50 percent of consumers in China report a perception that protein in milk is good for immunity (Mintel 2020b), and a leading dairy company found that 80 percent of consumers surveyed in seven large cities reported basing their purchases on which “nutritional content was better” (Snell 2014, p. 70).

The boundaries between politics and economics are not distinct, but **are even blurrier in China** when compared to many other nations (DuBois 2022). Dairy firms have a strong influence on political leaders, and political leaders frequently advocate increased consumption of dairy. One of the most famous examples is the following statement:

I have a dream that every Chinese person, especially the children, will be able to drink one jin [500g] of milk each day.

- Chinese Premier Wen Jiabao, April 23, 2006, Chongqi

This amount was much higher than the 100 grams of milk and dairy products recommended in the national dietary guidelines at that time—although the recommendation was increased to 300 grams the following year. **Government support for increased milk production includes the National School Milk Programme**, established in 2000 in conjunction with the Dairy Association of China, which now provides free lunches with milk to 27 million children. The program emphasizes a potential association between milk consumption and height, although some researchers suggest that studies observing these changes have not sufficiently controlled for the effects of increased calorie consumption (Wiley 2016).

Another nutrient that is emphasized when promoting milk is its calcium content. The bioavailability of calcium, however, is not well understood. **Some studies have measured declines in calcium intake in China as milk consumption increased**, in part due to declining consumption of other calcium rich foods such as vegetables and grains (Sharma and You 2014).

As diets incorporate **more dairy products** it is **at the expense of other, more diverse food sources**, and usually displaces unprocessed or minimally processed foods, rather than packaged foods. "From 1990 to 2007, the amount of grain consumed annually per person dropped from 131 to 78 kg while that of vegetables also declined from 139 to 118 kg" (Snell 2014). This “Westernization” of diets is shaped by the political and economic influence of powerful firms, and behind the scenes many of them have successfully blocked efforts to reduce consumption of dairy, meat and ultraprocessed foods (Nestle 2013).

Many dairy product categories involve highly industrial manufacturing processes

Milk powder production

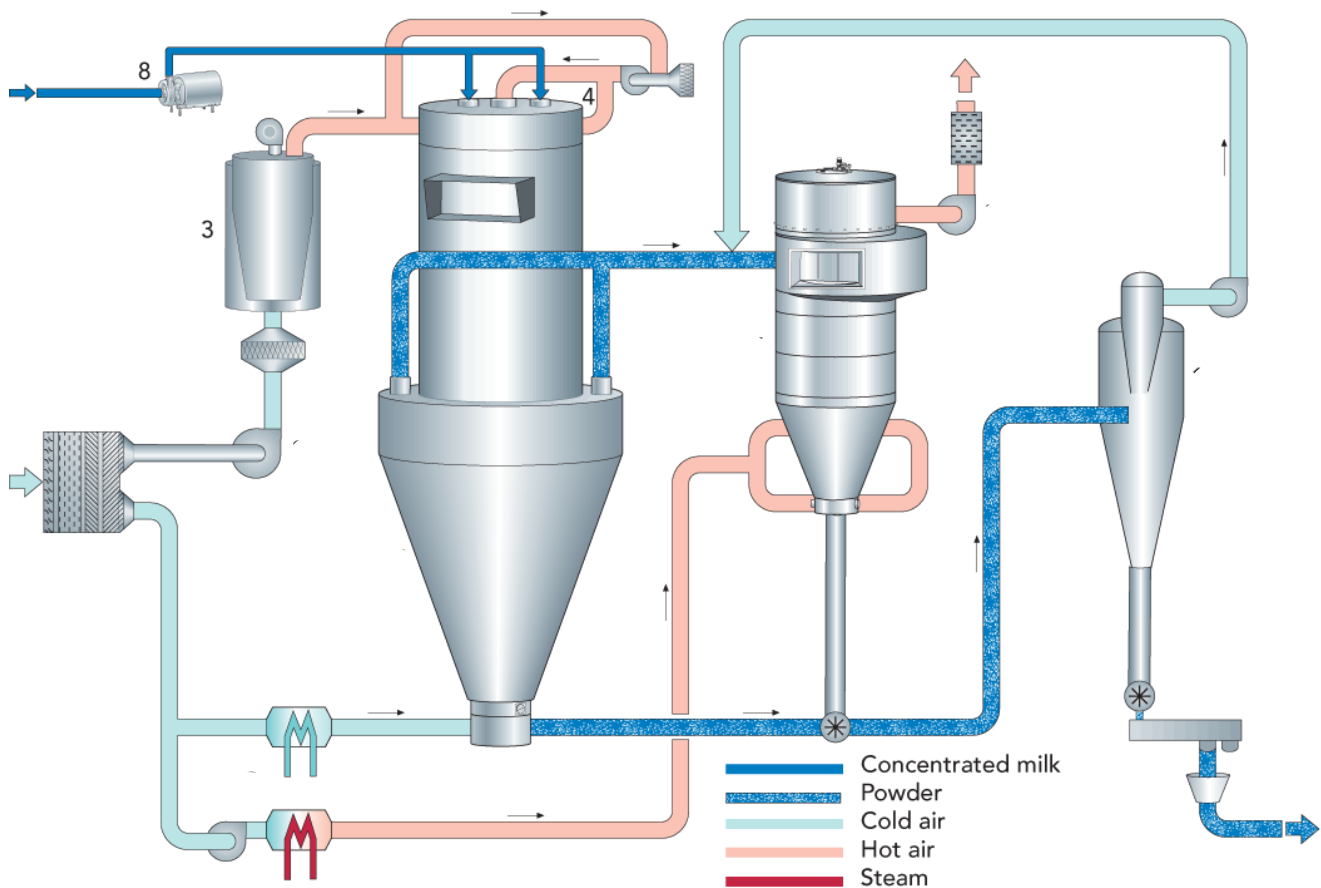


Image: wikipedia/commons/b/b8/Milk_production.png

Ultra-high temperature (UHT) milk production

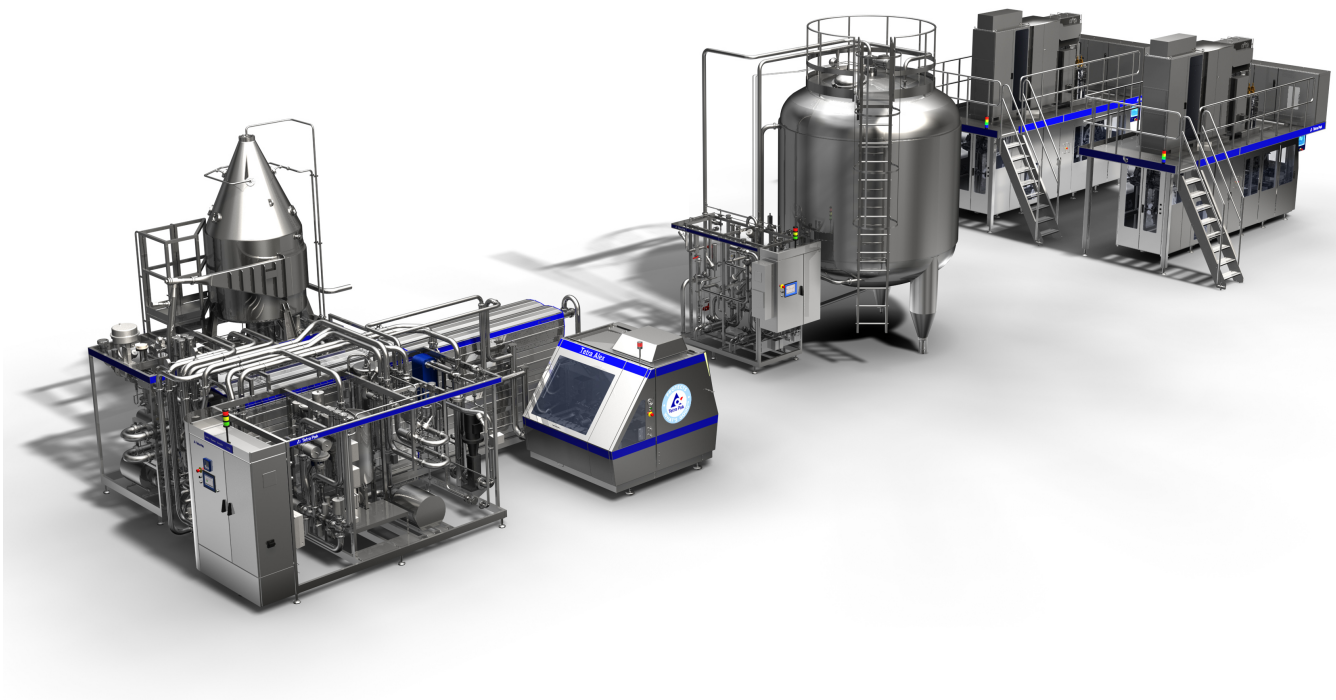
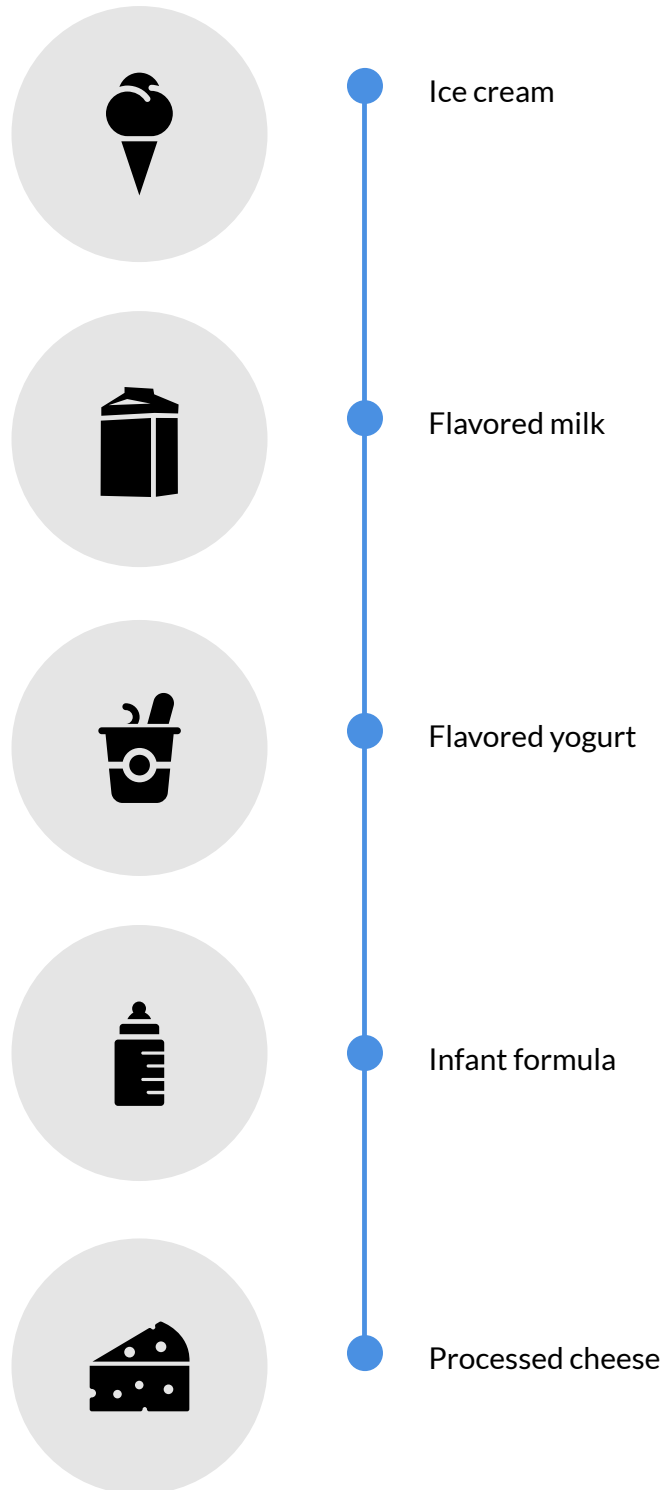


Image: www.flickr.com/photos/tetrapak/6266495186/

Ultraprocessed dairy products

These products may be engineered to be hyper-palatable, “craveable,” or addictive, including the addition of industrially formulated or laboratory synthesized substances



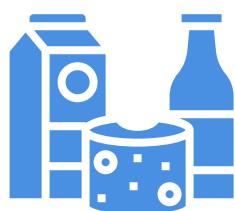
A vicious circle

Cheap ingredients contribute to higher profit margins, which leads to an ever increasing marketing emphasis on these product categories—they are also promoted to be consumed in unbalanced dietary patterns, such as frequently and mindlessly as snacks

Sales of dairy products in ultraprocessed forms are increasing in China, even as the per capita consumption of milk and dairy has remained relatively flat. Definitions of ultraprocessed are contested, but most refer to ingredients that would be unlikely to be found in a kitchen, such as high-fructose corn syrup, hydrogenated or interesterified oils, hydrolyzed proteins, or synthetic additives designed to make the product more appealing. Some of the advantages for firms that manufacture these products include: (1) long shelf lives and the potential to be shipped long distances from lower cost of production regions, (2) the potential to incorporate cheap ingredients and therefore increase profit margins, and (3) the potential to be deliberately engineered to be hyper-palatable and bypass feelings of fullness.

Promoting the consumption of products **engineered with new flavors and textures** has been a common strategy in the dairy industry. The drinking yogurt category, for instance, sees hundreds of product rebrands or launches each year, such as a yogurt formulated with the taste of a popular brand of carbonated beverage, Arctic Ocean (Yili Group). In addition, the consumption of ultraprocessed dairy products is frequently **promoted as a meal replacement, snack or dessert**, not just for traditional meals. China has recently surpassed the United States as the world's largest ice cream producer, for example, although some of this production is exported to other countries in Asia (Inouye 2019).

Diets higher in ultraprocessed foods are associated with health problems, such as diabetes and cardiovascular disease, which, along with rates of obesity, are increasing in China. Although the mechanisms leading to these impacts are not well understood, "there is some evidence of the possible role of small particle size, chemical hydrogenation, neo-formed substances, chemical compounds released by packaging, and colourants, emulsifiers and artificial sweeteners" (Scrinis and Monteiro 2022, p. 672).



The claim: “rising consumer incomes are increasing demand for dairy”

1 What is implied as the problem?

Rising incomes are enabling more purchases of dairy products than China currently produces

2 What is implied as the solution?

Increase domestic production and imports to match anticipated changes in purchasing behaviors

3 What is left out?

The substantial role of marketing efforts for shaping and reshaping purchasing behaviors to benefit the largest firms and their investors, narrowing possibilities for more diverse, more regionally self-sufficient and less highly processed food systems

“...big businesses have the power to implant objects, images, messages and material infrastructures in our off-the-job behavioral settings, and, thereby, to influence the choices we make in our personal lives...they do so in order to maximize their shareholders' investment returns. The result is that, unless you happen to be a wealthy major investor, your personal life is a field of conflict with the ultra-rich.

Michael Dawson, *The Consumer Trap* (2005)

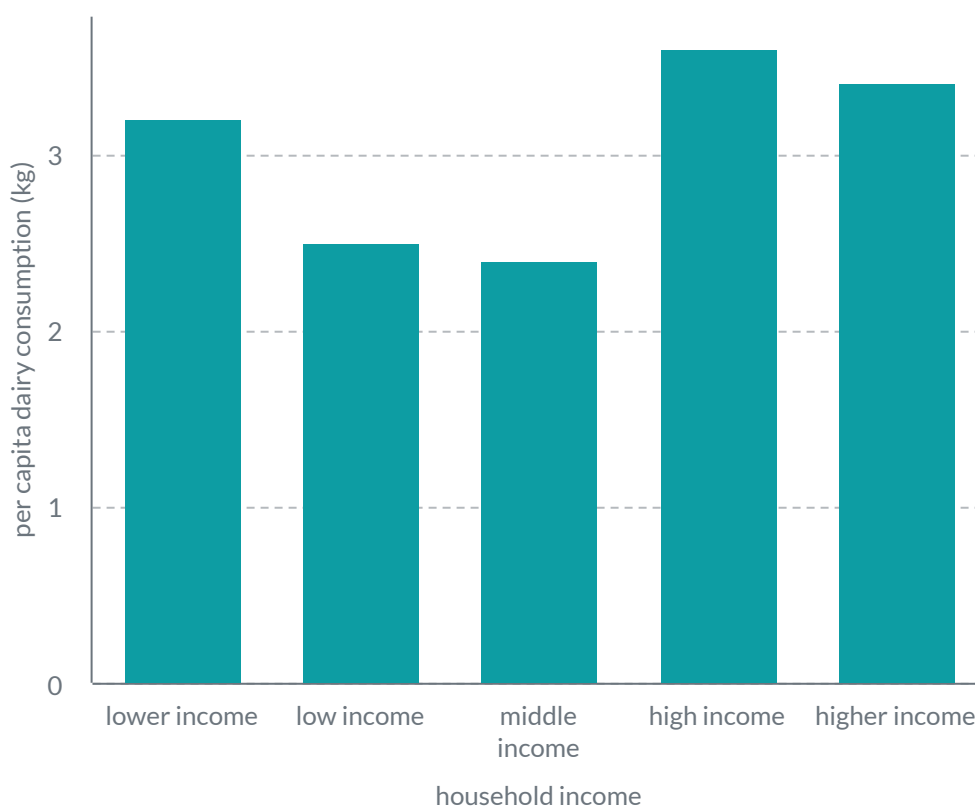
The third and final claim, that “rising consumer incomes are increasing demand for dairy” **implies that this is an automatic process**. It also suggests that greater consumer purchasing power is leading to more demand for dairy products than China currently produces. This in turn suggests a solution of increasing domestic production and imports to match these anticipated changes in purchasing behaviors.

These changes are actually resisted by many people, however, and it takes enormous effort to shape and re-shape demand to fit this narrative. “Firms survive today by convincing people to want what they sell, rather than reactively supplying what people need” (Carolan 2018, p. 77). Incomes are rising in China, but are not strongly correlated with changes in demand for dairy products (Fuller 2006). In a study in the Heilongjiang Province, for example, households in the lowest income category consumed more dairy than the low income and middle income categories (Yang et al. 2013, see figure below). Most rural areas tend to consume much less than income levels would predict, and national dairy consumption has not increased substantially since 2006.

What is **increasing** is **sales of more expensive products**, a strategy that dairy firms call “premiumization” and that they tout to their investors. There was an expectation that a declining percentage of income would go to food as incomes increased, but food and beverage firms are working to capture a greater share of these earnings—average annual salaries in China tripled from roughly USD \$3,000 in 2006 to USD \$10,000 in 2016. (Inouye 2019).

A key factor in resistance to increased dairy consumption is low levels of lactase production, which is estimated to affect more than 90 percent of the population of China. The discomfort that is likely to accompany consuming milk in more than small amounts for these individuals has led to a marketing focus on fermented products, such as drinkable yogurt, which have much lower levels of lactose. Drinkable yogurt is now the largest dairy category by volume, and Yili, Mengniu and Bright combine for 74 percent of sales.

Dairy consumption of rural residents in Heilongjiang Province in 2010



Data: Yang et al. 2013

Neuromarketing

Efforts to predict and manipulate consumer decision-making behavior with technologies that measure physiological and neural signals are described as neuromarketing



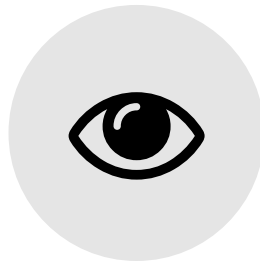
Functional magnetic resonance imaging

fMRI measures engagement and memory recall, providing insight into a subject's emotional response



Electroencephalogram

EEG records brain activity, measuring subject's detailed emotional response over short time periods and memory recall



Eye tracking

Pupil dilation and gaze direction shows what holds a subject's attention and what excites them



Biometrics

subject's heart rate, skin conductance, breathing and other physical measures



Sensory marketing

Influences subject's behavior through senses, such as pleasant smells

Hidden scope

Although academic researchers have used leading dairy brands in China in their neuromarketing research, little is known about the extent of its applications in dairy industry marketing efforts.

Another **barrier to increasing sales** was the **melamine contamination scandal of 2008**, which resulted in the adulteration of dairy products, including infant formula, to give the appearance of higher protein levels in quality tests. This sickened tens of thousands of children, and not only decreased dairy consumption, but shifted purchases to foreign firms that were viewed as more trustworthy. **Domestic firms** have successfully worked to rebuild their reputations, and **have regained market share**, even in the infant formula category. One key to this success was the Dairy Industry Association repeating the message that their products were more nutritious and cheaper than products from foreign firms (Whitehead 2013).

In **rural areas** where there is a culture of fresh milk consumption, **consumers have resisted purchasing ultra-high temperature (UHT) or shelf stable milk**. This product is the second leading dairy category by volume. School milk programs have helped to develop a taste for UHT milk in most other contexts, however. Due to the technological bottleneck of the licensing of packaging technologies controlled by a small number of foreign firms, such as Tetra Pak, the market is highly concentrated. Yili, Mengniu and Bright's combined share of the UHT milk market is the same as the drinkable yogurt category, 74 percent (Statista 2022).

Increasing the demand for dairy products has often had a higher priority than developing supply chains for these products, as illustrated by Mengniu's strategy of "establishing the market before production" (Mak 2021). A leading advertising agency executive said, "They're the Nike of milk. This is a masterful bit of branding, really. ... For the first few years they didn't own a single cow" (Epstein 2010).

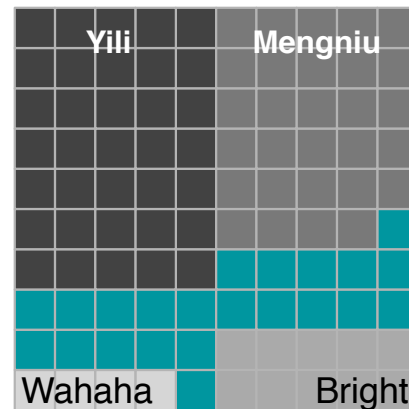
Traditional marketing by leading dairy firms includes **product design and branding, pricing, advertising** (such as featuring sports and entertainment celebrities), **public relations, and increasing retail access** (Baker et al. 2021). Mengniu spent 8.9% of its revenue on advertising and publicity in 2020, but this category does not capture all of its marketing expenditures, such as developing an online-to-offline home delivery. Less traditional marketing is also very effective, particularly in the high-margin infant formula category. The leading firm, Feihe, notes in its annual report that it held 500,000 face-to-face seminars in 2019, reaching 10 million people. All leading dairy firms are using greater amounts of data, and more sophisticated analysis, enabling highly differentiated or even individualized targeting of potential customers.

Some researchers, such as Harvard professor Gerald Zaltman (2003), claim that 95 percent of purchase decisions are controlled by the subconscious. The dairy industry is making **greater use of neuromarketing, or using physiological and neural signals to predict and manipulate consumer behaviors**. A consultant to Nestlé, for example, claims they measured electroencephalogram (EEG) responses to the development of a television commercial in 2010, which increased grocery sales 25 percent in the months after launch, with no other promotion or marketing efforts (Neuro-Insight 2022). Unilever reportedly found that ice cream triggers more pleasure in the brain than yogurt, and another firm stated that removing the foil from yogurt engaged the brain more than stirring or consuming the product.

Market shares of the top firms by dairy category in China

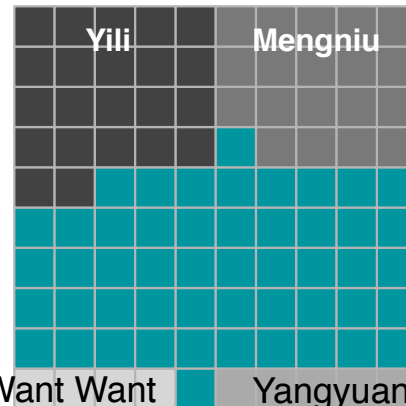
Drinkable yogurt is the largest category by volume. Baby formula is much smaller by volume, but the largest by monetary value.

Drinkable yogurt



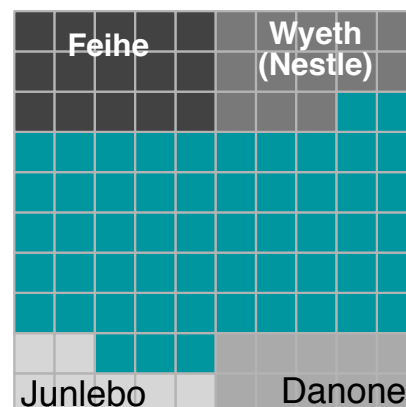
Top 4 market share in 2018: 78%

Milk



Top 4 market share in 2019: 49%

Baby formula



Top 4 market share in 2020: 45%

The rich get richer

Government policies prioritize support for the largest firms, which further reinforces their power, as well as financial gains for their investors

Appealing to culture while changing it

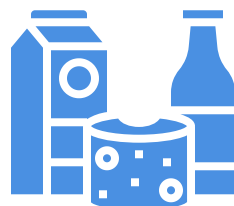


Marketing of milk and dairy products in China often appeals to pride in culture, while also shifting this culture in directions that increase the power of the largest firms. Some examples include:

- The increasing use of *Guochao* strategies—encouraging choosing national brands over foreign brands—but omitting the significant foreign investments many of these firms have received
- Feihe promotes its infant formula as “more suitable for Chinese babies,” but potentially undermines much more suitable breastfeeding
- Mengniu means “Mongolian cow” and evokes images of pastoral farming by concentrating its production this region, but the vast majority of the firm’s milk is from Dutch Holstein cows in confined operations
- New product introductions that include elements of Chinese culture, such as packaging with “old-fashioned” yogurt covers, tea cup shapes, or images of Confucius

Leading dairy brands in China have been used in academic neuromarketing research, but there is **little publicly available information on how these tools are applied** within the industry, and some analysts are more skeptical of their effectiveness.

The claim that rising consumers incomes are increasing demand for dairy also **steers attention away from the benefits that accrue to the largest firms and their investors**. Those with gatekeeping power typically limit choices to the options that are most likely to reinforce this power. Consumer demand is directed away from other foods and toward industrial dairy, especially for higher-priced and higher-margin branded products. This narrows the possibilities that more people would prefer, such as more diverse, more regionally self-sufficient and less highly processed food systems.



Conclusions and recommendations

1 The market price of dairy leaves out numerous costs to people and ecosystems

3 Dairy consumption would be lower without widespread and increasingly sophisticated marketing efforts

2 Dairy is increasingly consumed in ultraprocessed forms, and is displacing more diverse dietary patterns

The claims that dairy is cheap, nutritious, and that increasing demand is due to rising consumer incomes are frequently repeated, but very incomplete. Their blind spots include that the market price of dairy leaves out numerous costs to people and ecosystems, that dairy is increasingly consumed in ultraprocessed forms and is displacing more diverse dietary patterns, and that consumption would be lower without widespread and increasingly sophisticated marketing efforts.

One **recommendation is to raise awareness of the implicit assumptions and limitations** of these three claims, as well as **who is gaining power** from accepting them fully.

In particular, it should be noted that these these three claims about dairy in China:

- **steer attention away from recognizing that most of the benefits** from increased production and consumption of industrialized dairy products **flow to a tiny minority**
- **may close off possibilities** for food systems that are more diverse, more regionally self-sufficient, and less highly processed

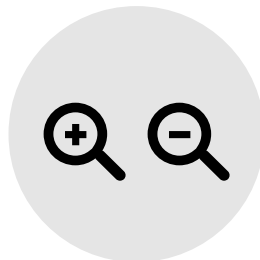
Short statements made by powerful food industry executives and government officials have the potential to substantially influence policy processes. Frequently, these perspectives reinforce lock-ins that place food systems decision-making in increasingly fewer hands, which in turn, has increasingly negative impacts.

Questions to ask about claims

Claims are short statements that identify and frame problems and/or put forward specific solutions and trajectories



What is implied as the problem and the solution?
Does the claim steer attention toward certain pathways?



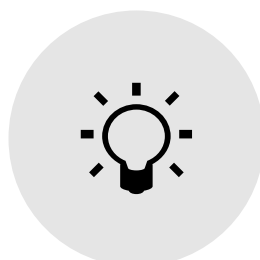
What is the evidence for and against the claim?
In what contexts is it more or less applicable?



What perspectives and data are left out?
Are only dominant views and sources considered?



Who benefits and who loses?
Is everyone affected equally by the changes that are stated or implied?



What other possibilities are being closed off?
Are more diverse, regionally self-sufficient and less highly processed options omitted?

Communicate the answers

Point out (1) the implicit assumptions and limitations of the claims, and (2) who is gaining power from accepting them fully

Analysis of these claims also points to problems extending beyond the dairy industry, including (1) cheap food policies, (2) an overemphasis on a very small number of nutrients, and (3) the influence of marketing efforts to limit personal and societal choices. Some recommendations for policy changes to address these issues include the following:

Cheap food, by nature of its design, a design predicated upon the socialization of most costs, is not affordable. Conventional wisdom says the surest way to improve global food security is with cheap—and, if possible, cheaper—food... Cheaper food is not the solution. It is the problem. Climate change, hunger, malnutrition, over-nutrition, decimated rural communities, and an even more decimated peasantry: we have cheap food to thank for all that... If people were paid what amounts to a livable wage they would not “need” cheap food.

Michael Carolan, *The Real Cost of Cheap Food* (2018)

Limiting or removing the food industry's ability to use nutrient and health claims is an important step, as this is the primary means through which nutritional knowledge is now disseminated to the public, as well as a primary strategy for marketing highly processed foods. Limiting industry influence over the governments' dietary guidelines and food regulations is also essential if those guidelines and regulations are to be in the interests of public health, social equity, and ecological sustainability.

Gyorgy Scrinis, *Nutritionism: The Science and Politics of Dietary Advice* (2013)

Big business marketers are acutely aware of their reliance on sustaining a mass addiction to commercial television and its delicately and expensively crafted web of marketing-governed stimuli. If the public were to impose heavy taxes on private broadcasting and advertising, charge significantly steeper rates for its airwaves, or get seriously into the business of funding truly non-commercial competition with commercial providers of media content, this web would be subject to major attack and decline.

Michael Dawson, *The Consumer Trap* (2005)

Another broad problem is the increasing power of very large corporations, in dairy production and processing, as well as in numerous other industries. A policy recommendation to address this trend is to **dismantle the subsidies provided to dominant firms**. These subsidies include direct payments and tax deductions, as well as indirect advantages, such as the provision of infrastructure and government policies that create barriers for smaller firms.

Due to the influence of politically powerful individuals and organizations, **implementing these or numerous other well-intentioned policy suggestions is likely to be extremely difficult**. Therefore, **challenging problematic claims made by these interests**, such as "feed the world" narratives, is an **important initial step toward reducing their influence**.

More dialogue in forums where simplistic claims are being made should be encouraged, emphasizing a greater recognition of nuances, contextual differences, and options for more sustainable food system pathways that are typically removed from consideration. These pathways may include systems that produce and consume smaller-scale and agroecologically produced dairy products, or systems that do not include dairy products at all.

Claims that support highly centralized, subsidized and uniform pathways are much less likely to become self-fulfilling as they lose their legitimacy and their power to shape thoughts and behaviors. They will have less influence on the policy process and reduce the likelihood of policy outcomes that disproportionately harm the majority.



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