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CHINA'S FOOD PAGODAS: LOOKING FORWARD BY LOOKING  
BACK?

*Yifei Li and Dale Jamieson*

# China's Food Pagodas: Looking Forward by Looking Back?

Yifei Li and Dale Jamieson\*

## Abstract

In this Article we provide a close analysis of the Chinese Dietary Guidelines – the Food Pagoda. Our focus on the dietary guidelines is motivated by two main considerations. First, the guidelines represent the most comprehensive, nationwide, state-sponsored effort to educate the people of China about food. Like citizens in most countries, Chinese people are presented with numerous, often competing, messages from scientists, food gurus and online influencers. The dietary guidelines are different in that they are backed by an entire suite of governmental resources for nationwide dissemination through hospitals, schools, public billboards, TV and radio ads, among others. Among all the food advices and recommendations in China, it is the official dietary guidelines that have the greatest potential for changing dietary preferences. Second, understanding the Chinese dietary guidelines provides a useful basis for international comparison, since more than 100 countries around the world have dietary guidelines. Whether in the form of a pyramid or a plate, visualizations of the “ideal” national diet have become a common vector for official food advice. Examining the dietary guidelines therefore helps situate China in the broader context of government-proffered food advice. In this Article, we examine the historical evolution of China's Dietary Guidelines and their implications for environment, health, and animal welfare. Comparing the guidelines to longitudinal survey data about actual consumption provides a unique window on these issues, and in this Article we discuss what this glimpse may suggest for climate, health, and animal welfare going forward.

## I. Introduction

At the height of COVID-19's initial outbreak in China, alongside lockdowns, contact tracing, and medical resource mobilization, an integral part of China's national pandemic response

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strategy was the Dietary Guidelines for the Prevention and Treatment of COVID-19.<sup>1</sup> Consistent with health practices since Chinese antiquity,<sup>2</sup> the Guidelines stress the importance of a balanced diet in fending off diseases.<sup>3</sup> The ancient Chinese adage that “food is the absolute to the people,” or “*min yi shi wei tian*,” still rings true.

Despite the centrality of food in Chinese culture and the weight of the nation's food economy, it is glaringly absent when it comes to broader conversations about China's environmental protection and responses to climate change. China's national food policies have largely been driven by nutritional and health considerations, to the neglect of the myriad connections of the food economy to wider issues of climate resilience, ecological sustainability, and animal welfare.

China is not alone in this respect. In April, 2021, in response to a claim circulating in right-wing media outlets, the U.S. Secretary of Agriculture declared that “there is no effort designed to limit people's intake of beef coming out of President Biden's White House or USDA.”<sup>4</sup> The sheer political power of animal agriculture is enough to ensure that in most countries, taking beef off the table, is not on the table for discussion.<sup>5</sup>

It was thus both surprising and striking when a widely circulated news story in *The Guardian* praised China for displaying “massive leadership” in planning to “cut meat consumption in half,”

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<sup>1</sup> See Xinxing Guanzhuang Bingdu Ganran de Feiyan Fangzhi Yingyang Shanshi Zhidao (新型冠状病毒感染的肺炎防治营养膳食指导) [Nutritional Dietary Guidance for the Prevention and Treatment of Pneumonia Caused by New Coronavirus Infection], GUOJIA WEISHENG JIANKANG WEIYUANHUI (国家卫生健康委员会) [NATIONAL HEALTH COMMISSION] (Feb. 8, 2020), <http://www.nhc.gov.cn/sps/s7886/202002/a69fd36d54514c5a9a3f456188cbc428.shtml>.

<sup>2</sup> See RUTH ROGASKI, *HYGIENIC MODERNITY: MEANINGS OF HEALTH AND DISEASE IN TREATY-PORT CHINA* 23-25 (2014).

<sup>3</sup> Xinxing Guanzhuang Bingdu Ganran de Feiyan Fangzhi Yingyang Shanshi Zhidao (新型冠状病毒感染的肺炎防治营养膳食指导) [Nutritional Dietary Guidance for the Prevention and Treatment of Pneumonia Caused by New Coronavirus Infection], *supra* note 1.

<sup>4</sup> Ryan McCrimmon, *Biden Isn't Banning Meat, USDA Chief Says*, POLITICO (Apr. 26, 2021), <https://www.politico.com/news/2021/04/26/biden-not-banning-meat-usda-484609>.

<sup>5</sup> See Oliver Lazarus et al., *The Climate Responsibilities of Industrial Meat and Dairy Producers*, 165 CLIMATIC CHANGE 1, 2, 10, 15, 17-18 (2021), <https://link.springer.com/content/pdf/10.1007/s10584-021-03047-7.pdf>.

a policy move that was said to be “cheered by climate campaigners.”<sup>6</sup> The main reference of the *Guardian* story was the 2016 update to China’s national dietary guidelines, also known as the “Food Pagoda,” which recommended daily consumption of forty to seventy-five grams of meat for the average Chinese adult.<sup>7</sup> The prospect of China’s diet going green brings excitement and hope to a country that is troubled by environmental crises from “airpocalypse” to “aporcalypse,” and to a world that is deep in planetary climate catastrophe.

There are many reasons for environmental and animal welfare groups to be concerned about China’s food trajectory. Globally, food system-related greenhouse gas (GHG) emissions – at 18 Gt CO<sub>2</sub> equivalent in 2015 – amount to more than a third of the world’s total emissions.<sup>8</sup> The most substantial share of food-related GHG is generated by animal-sourced food production.<sup>9</sup> According to OECD data, China accounted for 26.3 percent of the world’s total meat consumption in 2018, up from 14.6 percent in 1990.<sup>10</sup> In per capita terms, the average Chinese person consumed 49.3 kilograms of meat in 2018, more than tripling the 1990 figure of 15.6 kilograms.<sup>11</sup> In 2018, the per capita consumption level in China exceeded the global average of 34.8 kilograms by 41.7 percent, quickly approaching the OECD average of 69.5 kilograms.<sup>12</sup> In 2016 alone, China slaughtered more than 14 billion terrestrial animals for food, or about 448 animals per second.<sup>13</sup>

The rapid transformation of China’s food economy is a clear testament to the success with which the most populous country on the planet has managed to alleviate poverty, but it is also a source of

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<sup>6</sup> Oliver Milman & Stuart Leavenworth, *China’s Plan to Cut Meat Consumption by 50% Cheered by Climate Campaigners*, THE GUARDIAN (June 20, 2016), <https://www.theguardian.com/world/2016/jun/20/chinas-meat-consumption-climate-change>.

<sup>7</sup> Yiban Renqun Shanshi Zhinan (一般人群膳食指南) [Dietary Guidelines for the General Population], ZHONGGUO YINGYANG XUEHUI (中国营养学会) [CHINESE NUTRITION SOCIETY], <http://dg.cnsoc.org/article/2016b.html> (last visited Oct. 20, 2021).

<sup>8</sup> M. Crippa, et al., *Food Systems Are Responsible for a Third of Global Anthropogenic GHG Emissions*, 2 NATURE FOOD, 198, 198–209 (2021).

<sup>9</sup> Matthew N. Hayek et al., *The Carbon Opportunity Cost of Animal-Sourced Food Production on Land*, 4 NATURE SUSTAINABILITY 21, 21 (2021).

<sup>10</sup> Meat Consumption, ORGANISATION FOR ECON. COOP. & DEV., <https://data.oecd.org/agroutput/meat-consumption.htm> (last visited Oct. 20, 2021).

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> *Animal Slaughter and Meat Production – China*, TERRASTENDO (Jan. 26, 2018), <https://terrastendo.net/infographics/animal-slaughter-and-meat-production-china/> (last visited Oct. 20, 2021).

growing concern for Chinese policymakers. With obesity – and especially child obesity – on the rise, and a host of diet-related diseases becoming more prevalent than ever, the public health implications of high-energy and protein-rich food consumption are becoming harder to overlook.<sup>14</sup> At the same time, rapid urbanization puts unprecedented strains on rural agricultural productivity in a country where per capita arable land is a less than half of the global average, thus posing a serious challenge to self-sufficiency.<sup>15</sup> Improving access to food has morphed from an overwhelming social, political, and economic success, to a salient health, and even security risk for China.

It is in this context that the environmental implications of the Chinese food economy have gained renewed importance. From phosphorus, nitrogen, and GHG emissions to water and land uses, China's diet has an outsized impact on all aspects of global sustainability, health, and wellbeing.<sup>16</sup> The need to address the climate-agriculture nexus is further accentuated by the Chinese leadership's ambitious goal to peak carbon emissions before 2030 and to reach carbon neutrality by 2060.<sup>17</sup> A greener diet has the potential to help achieve environmental goals, and also contribute to population health, enhance food security, and improve animal welfare.<sup>18</sup> Greening China's diet is therefore a truly monumental task for China and the world.

In this spirit, we provide a close analysis of the Chinese Dietary Guidelines – the Food Pagoda. Our focus on the dietary guidelines is motivated by two main considerations. First, the guidelines represent the most comprehensive, nationwide, state-

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<sup>14</sup> See H. Charles Godfray et al., *Meat Consumption, Health, and the Environment*, 361 *SCIENCE* 1, 2-3 (2018), <http://yacoby.physics.harvard.edu/Publications/eaam5324.full.pdf>. See also Y. Li et al., *Determinants of Childhood Overweight and Obesity in China*, 97 *BRIT. J. NUTRITION* 210, 211-12 (2007); Jiguo Zhang et al., *Dietary Patterns and Their Associations with Childhood Obesity in China*, 113 *BRIT. J. NUTRITION* 1978, 1978 (2015).

<sup>15</sup> Chunyang He et al., *Urban Expansion Brought Stress to Food Security in China: Evidence from Decreased Cropland Net Primary Productivity*, 576 *SCI. TOTAL ENV'T* 660, 661 (2016).

<sup>16</sup> See Yuanchao Hu et al., *Food Production in China Requires Intensified Measures to Be Consistent with National and Provincial Environmental Boundaries*, 1 *NATURE FOOD* 572, 572 (2020).

<sup>17</sup> Steven Lee Myers, *China's Pledge to Be Carbon Neutral by 2060: What It Means*, *N.Y. TIMES* (Sept. 23, 2020), <https://www.nytimes.com/2020/09/23/world/asia/china-climate-change.html>.

<sup>18</sup> See *ACAD. OF GLOB. FOOD ECONS. & POL'Y, CHINA AGRIC. UNIV. [AGFEP] ET AL., 2021 CHINA AND GLOBAL FOOD POLICY REPORT: RETHINKING AGRIFOOD SYSTEMS FOR THE POST-COVID WORLD* 41-42 (2021).

sponsored effort to educate the people of China about food. Like citizens in most countries, Chinese people are presented with numerous, often competing, messages from scientists, food gurus and online influencers. The dietary guidelines are different in that they are backed by an entire suite of governmental resources for nationwide dissemination through hospitals, schools, public billboards, TV and radio ads, among others. Among all the food advices and recommendations in China, it is the official dietary guidelines that in China have the greatest potential for changing dietary preferences. Second, understanding the Chinese dietary guidelines provides a useful basis for international comparison, since more than 100 countries around the world have dietary guidelines.<sup>19</sup> Whether in the form of a pyramid or a plate, visualizations of the “ideal” national diet have become a common vector for official food advice.<sup>20</sup> Examining the dietary guidelines therefore helps situate China in the broader context of government-proffered food advice. In this Article, we examine the historical evolution of China’s Dietary Guidelines and their implications for environment, health, and animal welfare. Comparing the guidelines to longitudinal survey data about actual consumption provides a unique window on these issues, and in this Article we discuss what this glimpse may suggest for climate, health, and animal welfare going forward.

We want to emphasize at the outset the tentative nature of our conclusions. In principle, a more sophisticated modeling approach could provide stronger evidence for our claims, but the sporadic and potentially unreliable nature of the data, and the way that it is aggregated, make it difficult to implement such an approach with any confidence. In any case, we believe that the methods that we employ in this paper provide new insights and suggest productive lines of further research.<sup>21</sup>

## II. China’s Dietary Guidelines

From the early nineteenth century until the end of the Great Leap Forward in 1961, famines were an every-generational

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<sup>19</sup> FOOD & AGRIC. ORG. OF THE UNITED NATIONS [FAO], FOOD-BASED DIETARY GUIDELINES, <http://www.fao.org/nutrition/nutrition-education/food-dietary-guidelines/en/> (last visited Oct. 20, 2021).

<sup>20</sup> Xinxing Guanzhuang Bingdu Ganran de Feiyan Fangzhi Yingyang Shanshi Zhidao (新型冠状病毒感染的肺炎防治营养膳食指导) [Nutritional Dietary Guidance for the Prevention and Treatment of Pneumonia Caused by New Coronavirus Infection], *supra* note 1.

<sup>21</sup> Similar points about methodology are made by Hu. See Hu, *infra* note 83.

occurrence in China.<sup>22</sup> When the People's Republic of China was declared in 1949, life expectancy at birth was 35 years.<sup>23</sup> It increased gradually over the next decade, but not dramatically until after the Great Leap Forward.<sup>24</sup> Since then, there has been an astounding improvement in food accessibility with dramatic results. For example, 9-year old boys in China in 2019 were 8 cm taller than in 1985, the largest increase of any country in the world over that period of time.<sup>25</sup>

China's first national dietary guidelines were produced in 1989 when the memory of famine was still fresh and about 200 million people remained undernourished.<sup>26</sup> The guidelines took the form of eight qualitative recommendations: (1) Eat a variety of foods; (2) Do not be hungry, and do not eat until too full; (3) Eat moderate amounts of oils and fats; (4) Balance coarse and refined grains; (5) Use a limited amount of salt; (6) Eat fewer sweets; (7) Moderate alcoholic drinks; and (8) Balance the three daily meals (Standing Board of Chinese Nutrition Society 1990).<sup>27</sup> In its original publication, each entry was followed by a paragraph of brief explanation.<sup>28</sup> A set of eight posters were designed and widely distributed, each corresponding to one of the recommendations.<sup>29</sup>

In 1997, the guidelines were revised by a broad group of nutritionists, and for the first time took the visual form of the pagoda and provided specific quantitative recommendations for daily food consumption (Figure 1).<sup>30</sup>

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<sup>22</sup> See S.F. Du et al., *China in the Period of Transition from Scarcity and Extensive Undernutrition to Emerging Nutrition-Related Non-Communicable Diseases, 1949–1992*, 15 *OBESITY REVS.* 8, 8(2013).

<sup>23</sup> *Id.* at 13-14.

<sup>24</sup> *Id.*

<sup>25</sup> Andrea Rodriguez-Martinez et al., *Height and Body-Mass Index Trajectories of School-Aged Children and Adolescents from 1985 to 2019 in 200 Countries and Territories: A Pooled Analysis of 2181 Population-Based Studies with 65 Million Participants*, 396 *LANCET* 1511, 1515 (2020).

<sup>26</sup> FOOD & AGRIC. ORG. OF THE UNITED NATIONS [FAO], *THE STATE OF FOOD INSECURITY IN THE WORLD 2006: ERADICATING WORLD HUNGER* (2006).

<sup>27</sup> *Zhongguo Jumin Shanshi Zhinan* "1989 Nian Banben" (《中国居民膳食指南》1989 年版本) ["Dietary Guidelines for Chinese Residents" 1989 Edition],

ZHONGGUO YINGYANG XUEHUI (中国营养学会) [CHINESE NUTRITION SOCIETY], <http://dg.cnsoc.org/article/1989b.html> (last visited Oct. 20, 2021).

<sup>28</sup> Keyou Ge, *The Transition of Chinese Dietary Guidelines and the Food Guide Pagoda*, 20 *ASIA PAC. J. CLINICAL NUTRITION* 439, 439-40 (2011), <https://www.airitilibrary.com/Publication/alDetailedMesh?DocID=09647058-201109-201306100025-201306100025-439-446>.

<sup>29</sup> *Id.*

<sup>30</sup> *Zhongguo Jumin Shanshi Zhinan* "1997 Nian Banben" (《中国居民膳食指南》1997 年版本) ["Dietary Guidelines for Chinese Residents" 1997 Edition],



Figure 1. The Food Pagoda (1997)

In 2007, the guidelines were revised by the Chinese Nutrition Society and endorsed by the Chinese Ministry of Health (Figure 2).<sup>31</sup>

ZHONGGUO YINGYANG XUEHUI (中国营养学会) [CHINESE NUTRITION SOCIETY], <http://dg.cnsoc.org/article/1997b.html> (last visited Oct. 20, 2021).

<sup>31</sup> “Zhongguo Jumin Shanshi Zhinan” 2007 Nian Banben (《中国居民膳食指南》2007年版本) [“Chinese Resident Dietary Guidelines” 2007 Edition],

ZHONGGUO YINGYANG XUEHUI (中国营养学会) [CHINESE NUTRITION SOCIETY], <http://dg.cnsoc.org/article/2007b.html> (last visited Oct. 20, 2021).

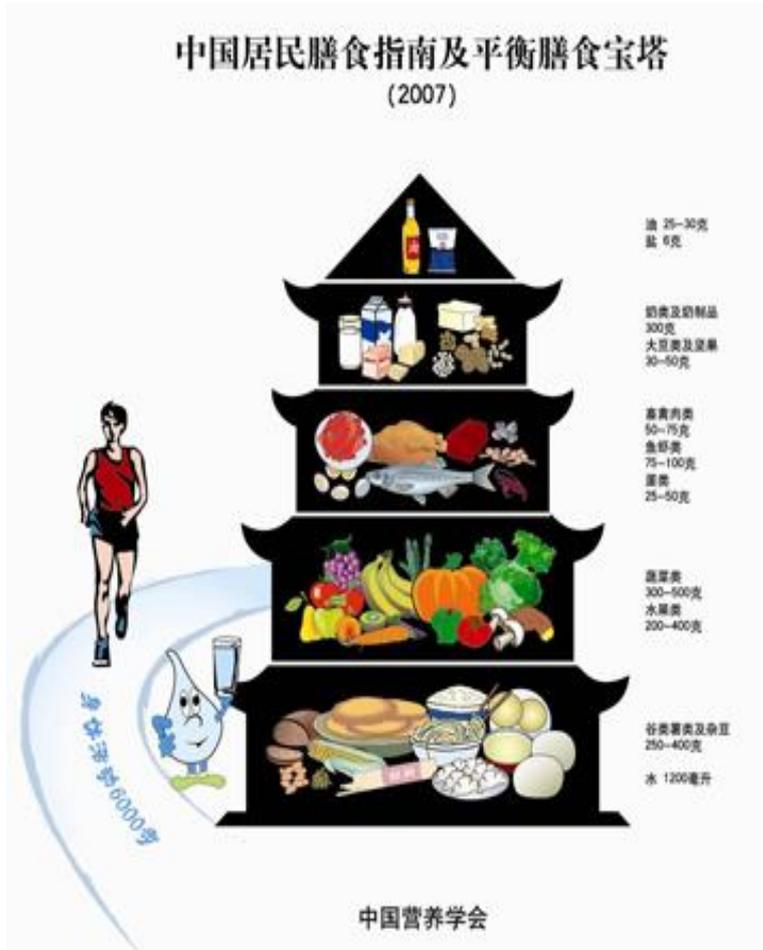


Figure 2. The Food Pagoda (2007)

In 2016 the pagoda was revised again (Figure 3) on orders from the National Health Commission of China (what had previously been the Ministry of Health).<sup>32</sup>

<sup>32</sup> Yiban Renqun Shanshi Zhinan (一般人群膳食指南) [Dietary Guidelines for the General Population], *supra* note 7.



Figure 3. The Food Pagoda (2016)

The primary function of the guidelines is public education. Through information campaigns, propaganda posters, dedicated media programming, school curricula, and other means, health authorities all over China regularly sponsor events that prominently feature the food pagoda.<sup>33</sup> The express purposes of these events are to call attention to the most pressing diet-related health concerns of the nation and to encourage citizens to follow the latest consensus among Chinese nutritionists.<sup>34</sup> Since the guidelines' most recent update in 2016, provincial and local governments across the country have rallied up comprehensive support mechanisms to raise public awareness of the guidelines, in compliance with top-level mandates

<sup>33</sup> Ge, *supra* note 28, at 439-40.

<sup>34</sup> See YueXin Yang et al., *New Chinese Dietary Guidelines: Healthy Eating Patterns and Food-Based Dietary Recommendations*, ASIA PAC. J. CLINICAL NUTRITION 908, 908-13 (2018), <https://apjcn.nhri.org.tw/server/APJCN/27/4/908.pdf>.

from Beijing.<sup>35</sup> For example, the hallways of hospitals are decorated with propaganda posters that feature the food pagoda, reminding pregnant women to have plenty of dairy and meat.<sup>36</sup> These efforts have paid off. Survey data show that incrementally larger shares of the Chinese population – from 7.5 percent in 2004 to 21.1 in 2015 – have been made aware of the guidelines.<sup>37</sup>

Each iteration of the guidelines has been issued in a country that has undergone serious change since the previous guidelines. In 1989 per capita income was \$311 per year and three-quarters of the population was rural.<sup>38</sup> In 2016 per capita income was more than \$8,000 per year and only 43% of the population was rural.<sup>39</sup> Today, with 11% of the population malnourished and 25% overweight, China's nutritional profile resembles that of a western nation.<sup>40</sup> The authors of the guidelines emphasize that, in addition to being based on the evolving science of nutrition, they are responsive to changing Chinese dietary habits.<sup>41</sup> According to China's top nutritionist Keyou

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<sup>35</sup> See Xiaoyuan Xing et al., *Analysis on the Publicity and Education Effect of Urban Community Middle-Aged and Elderly People Nutrition and Dietary*, 101 *ADVANCES SOC. SCI., EDUC. & HUMS. RSCH.* 467, 467-472 (2017), <https://www.atlantispress.com/article/25874418.pdf>.

<sup>36</sup> See *id.* at 470.

<sup>37</sup> Xiaofang Jia (贾小芳) et al., *2004—2015 Nian Zhongguo Chengnian Jumin Shanshi Yingyang Zhishi Zhixiao Lu de Bianhua Qushi (2004—2015 年中国成年居民膳食营养知识知晓率的变化趋势) [Changes in the Awareness Rate of Dietary Nutrition Knowledge Among Chinese Adult Residents from 2004-2015]*, 49 *WEI SHENG YAN JIU (卫生研究) [J. HYGIENE RSCH.]* 345, 345–56 (2020).

<sup>38</sup> *GDP Per Capita (Current US\$) —China*, THE WORLD BANK (2021), <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=CN> (last visited Oct. 16, 2021); *Rural Population (% of Total Population) —China*, THE WORLD BANK (2021), <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=CN> (last visited Oct. 16, 2021).

<sup>39</sup> *GDP Per Capita (Current US\$) —China*, *supra* note 38; *RURAL POPULATION (% OF TOTAL POPULATION) Rural Population (% of Total Population) —China*, *supra* note 38.

<sup>40</sup> See *China*, WORLD FOOD PROGRAMME, <https://www.wfp.org/countries/china> (last visited Oct. 20, 2021). By way of comparison, more than 10% of US households are considered food insecure while more than 70% of Americans are overweight or obese. See *Security Status of U.S. Households in 2020*, U.S. DEPT OF AGRIC., ECON. RSCH. SERV., <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx> (Sept. 8, 2021); *Overweight & Obesity Statistics*, NAT'L INST. OF DIABETES & DIGESTIVE & KIDNEY DISEASES, <https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity> (Aug. 2017).

<sup>41</sup> See *Zhongguo Jumin Shanshi Zhinan de Fa Zhan Zhuangkuang (中国居民膳食指南的发展状况) [The Development Status of Chinese Residents' Dietary*

Ge, each iteration of the food pagoda was formulated after extensive deliberation among the nation's nutritionists on the basis of empirical evidence from the once-every-decade national nutrition surveys.<sup>42</sup> In 1959, the Chinese government conducted a nutritional survey, and since 1982 it has conducted a nutritional survey every ten years.<sup>43</sup> By closely examining the relationship between the recommendations and the survey data, we can reconstruct some underlying patterns in China's food policies.<sup>44</sup>

### III. The Humble Pagoda

When comparing the recommendations to actual behavior, the most striking feature is the gap between the two.

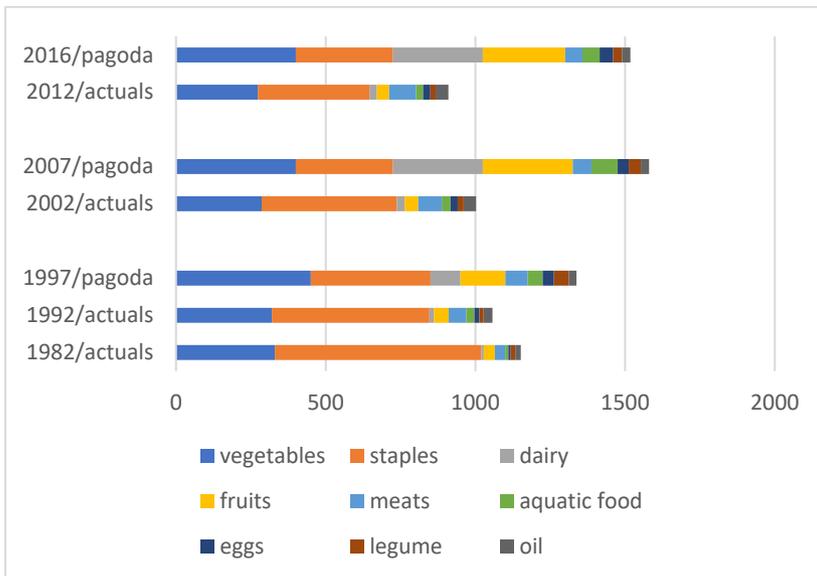


Figure 4. China's Diet, Surveyed Trends (1982, 1992, 2002, 2012) and Pagoda Goals (1997, 2007, 2016) (grams/day)<sup>45</sup>

Guidelines], ZHONGGUO YINGYANG XUEHUI (中国营养学会) [CHINESE NUTRITION SOCIETY], <http://dg.cnsoc.org/article/lsqy.html> (last visited Oct. 20, 2021).

<sup>42</sup> See Ge, *supra* note 28, at 439.

<sup>43</sup> Yuna He et al., *Data Resource Profile: China National Nutrition Surveys*, 48 INT'L J. EPIDEMIOLOGY 368, 368-368f (2019).

<sup>44</sup> There are no computer files for the 1959 survey so, like most scholars, we begin our investigation with the 1982 survey.

<sup>45</sup> See "2006 Zhongguo Weisheng Tongji Nianjian" (《2006 中国卫生统计年鉴》) ["2006 China Health Statistics Yearbook"], GUOJIA WEISHENG JIANKANG WEIYUANHUI (国家卫生健康委员会) [NATIONAL HEALTH COMMISSION], <http://www.nhc.gov.cn/htmlfiles/zwgkzt/ptjnj/year2006/index.html> (last visited

In every case the recommendations call for significantly greater food consumption by weight than is actually consumed.<sup>46</sup> Even more striking is the fact that actual consumption has been declining since the first survey in 1982, and the gap between actual consumption and the recommendations has been growing.<sup>47</sup> Food consumption by weight does not convert easily into calories, especially when multiple food groups are involved.<sup>48</sup> However, all the dietary recommendations are based on an intake of 2,400 calories per day, and the text that accompanies them indicates that anything between 1,600 and 2,400 calories per day is acceptable, depending on individual health conditions.<sup>49</sup> Roughly speaking, the actual Chinese diet is moving towards calorically dense food consumed in low quantities, while the recommendations would move the diet towards less calorically dense foods consumed in greater quantities.<sup>50</sup>

The feature of the 2016 food pagoda that caught the attention of the world was its ambition for drastically reducing China's meat consumption.<sup>51</sup>

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Nov. 28, 2021); *China Statistical Yearbook 2019*, NATIONAL BUREAU OF STATISTICS OF CHINA, <http://www.stats.gov.cn/tjsj/ndsj/2019/indexeh.htm> (last visited Nov. 29, 2021).

<sup>46</sup> See “*Zhongguo Jumin Shanshi Zhinan*” 1989 Nian Banben (《中国居民膳食指南》1989 年版本) [“*Dietary Guidelines for Chinese Residents*” 1989 Edition], *supra* note 27; *Zhongguo Jumin Shanshi Zhinan*” 1997 Nian Banben (《中国居民膳食指南》1997 年版本) [“*Dietary Guidelines for Chinese Residents*” 1997 Edition], *supra* note 30; “*Zhongguo Jumin Shanshi Zhinan*” 2007 Nian Banben (《中国居民膳食指南》2007 年版本) [“*Chinese Resident Dietary Guidelines*” 2007 Edition], *supra* note 31; *Yiban Renqun Shanshi Zhinan* (一般人群膳食指南) [Dietary Guidelines for the General Population], *supra* note 7.

<sup>47</sup> *Ge*, *supra* note 28.

<sup>48</sup> *Id.*

<sup>49</sup> He et al., *supra* note 43.

<sup>50</sup> *Id.*

<sup>51</sup> Milman & Leavenworth, *supra* note 6.

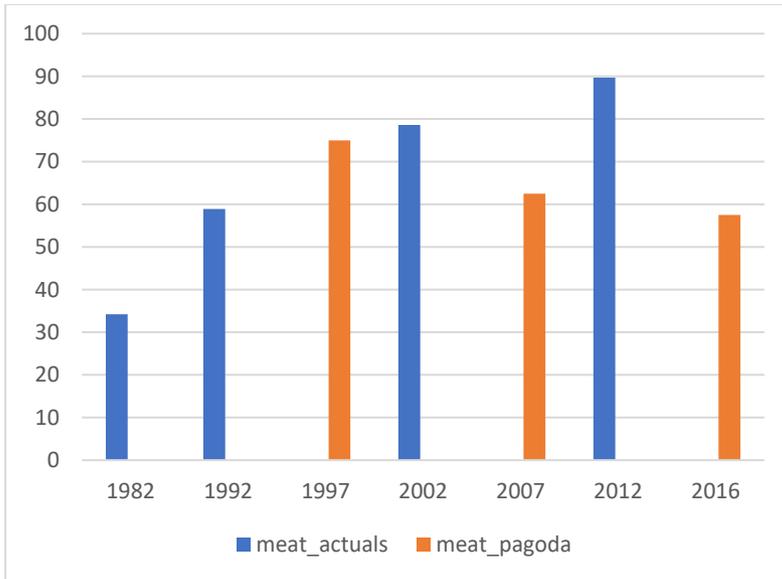


Figure 5. Meat in China's Diet, Observed Trends and Pagoda Goals (grams/day)<sup>52</sup>

What was less noticed is that the 2007 food pagoda had called for an even larger reduction in meat consumption from actual consumption levels.<sup>53</sup> In the face of the steady growth in meat consumption since 1982 (Figure 5), the 2016 recommendations doubled down and recommended even further reductions.<sup>54</sup>

It appears that in its 2016 recommendations, Chinese state nutritionists were acting against the rising tide, advocating for omnivorous moderation even when the country of 1.4 billion was exhibiting a growing appetite for meat.<sup>55</sup> However, in many areas, the pagoda recommendations reinforce, rather than challenge, existing dietary trends. As Figure 4 shows, this is most evidently the case for staples,<sup>56</sup> the observed consumption level of which has declined steadily at the rate of at least 15 percent per decennial interval.<sup>57</sup> The 2007 pagoda has followed suit in shedding its

<sup>52</sup> See “2006 Zhongguo Weisheng Tongji Nianjian” (《2006 中国卫生统计年鉴》) [“2006 China Health Statistics Yearbook”], *supra* note 45; *China Statistical Yearbook 2019*, *supra* note 45.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> Our tabulation for the category of staples includes rice, flour, cereals, tubers, and their products, in keeping with the convention in Chinese nutrition surveys.

<sup>57</sup> Ge, *supra* note 28 at 443.

recommended level of staples.<sup>58</sup> A similar pattern applies to vegetables.<sup>59</sup> Conversely, in the case of oil, observed consumption has gone up, and the pagoda recommendation has risen in synchrony.<sup>60</sup> Perhaps more salient are the cases of fruits and aquatic food, where the growth of consumption in early decades was followed by a moderate decline in recent periods in urban areas.<sup>61</sup> As if on cue, the pagoda recommendations initially went up before slipping downward.<sup>62</sup> In general, the food pagoda serves to reproduce existing trajectories, rather than contradicting them. Meat is an exception, rather than the norm, in the food pagoda.

The food pagodas' tendency to follow consumption is most evident in how the pagoda changes over time. In other words, the evolution of the food pagoda mimics the changing trajectory of food consumption in China. Steady growth in consumption predicts a continuous increase in the recommendation, whereas u-shaped consumption corresponds to u-shaped recommendation changes. Even though the absolute values of food recommendations are by no means close to the empirical trends, the decade-to-decade changes most certainly are.

This humble quality of the pagoda is consistent with the fact that the Chinese authorities do not appear to endorse the interpretation of the food pagoda as either a sign of, or vehicle for, Chinese environmental leadership. Indeed, the Chinese media routinely dismiss discussions about the global environmental implications of China's meat consumption. For example, a *Time* magazine cover story entitled "How China Could Change the World by Taking Meat Off the Menu" received a withering response in the official propaganda tabloid, *Global Times*.<sup>63</sup> According to the author,

"Chinese netizens slammed Western media as being hypocritical after an article boasted the popularity of meat substitutes in China while accusing China of overconsumption of meat which harms the

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<sup>58</sup> *Id.*

<sup>59</sup> *See id.* at 440-41.

<sup>60</sup> *See id.* at 442-44.

<sup>61</sup> *Id.* at 440.

<sup>62</sup> *Id.* at 442-43. Yiban Renqun Shanshi Zhinan (一般人群膳食指南) [Dietary Guidelines for the General Population], *supra* note 7.

<sup>63</sup> *See* Lu Yuanzhi, *West Should Cut Its Own Meat Consumption if It's Serious About the Climate*, GLOB. TIMES (Jan. 24, 2021), <https://www.globaltimes.cn/page/202101/1213792.shtml>; Charlie Campbell, *How China Could Change the World by Taking Meat off the Menu*, TIME (Jan. 22, 2021), <https://time.com/5930095/china-plant-based-meat/>.

environment, which, Chinese readers said not only looks like it is hinting that Chinese people are eating more meat substitutes as they feel guilty for eating too much meat and hurting the environment, but, more importantly, glossed over much higher levels of Western meat consumption.”<sup>64</sup>

Seen from the perspective of the humble pagoda, China’s “massive leadership” is more imagined than real.

#### **IV. The Aspirational Pagoda**

In the previous section, we suggested that the food pagoda is humbler than it might seem—that it tends to follow consumption trends rather than guide them. Even so, as Figure 6 makes clear the pagoda’s recommendations for fruits, aquatic foods, eggs seem perplexingly high (most puzzling of all is dairy which will be discussed in Section 5).

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<sup>64</sup> Xu Keyue, *Western Media Double Standard in Accusing China of Meat Overconsumption: Expert*, GLOB. TIMES (Jan. 24, 2021), <https://www.globaltimes.cn/page/202101/1213791.shtml>.

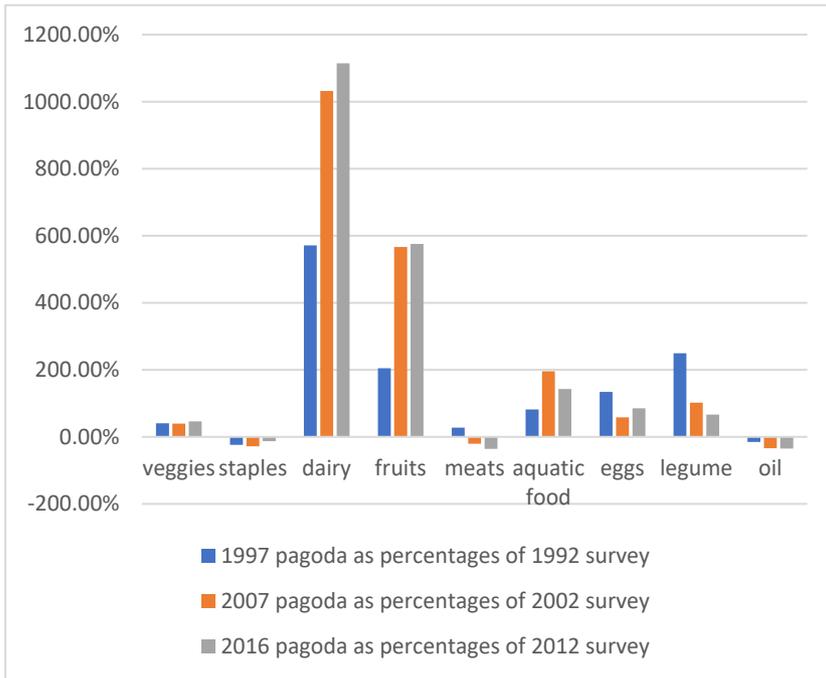


Figure 6. Pagoda Recommendations as Percentages of Corresponding Consumption Levels in the Prior Survey<sup>65</sup>

However, these recommendations take on a different meaning in the context of urban-rural disparity in China. In Figure 7 below, the horizontal axis shows the ratio of urban to rural consumption of foods. For example, urban dairy consumption is, on average, 5.12 times the rural figure, whereas urban staple consumption is only 0.77 of the rural statistic. The vertical axis, on the other hand, tracks the pagodas' recommended change from surveyed consumption levels. For example, the pagodas recommend taking, on average, 9.06 times more dairy than what Chinese residents consume in reality. The recommendation for staples, on the other hand, is to consume 0.21 times less than the status quo. After tabulating the correlation between these two statistics, we derive an  $R^2$  of 0.853, suggesting that 85.3% of the variation in the pagodas' recommended changes is explained by urban-rural differences in China.

<sup>65</sup> See "2006 Zhongguo Weisheng Tongji Nianjian" (《2006 中国卫生统计年鉴》) ["2006 China Health Statistics Yearbook"], *supra* note 45; China Statistical Yearbook 2019, *supra* note 45.

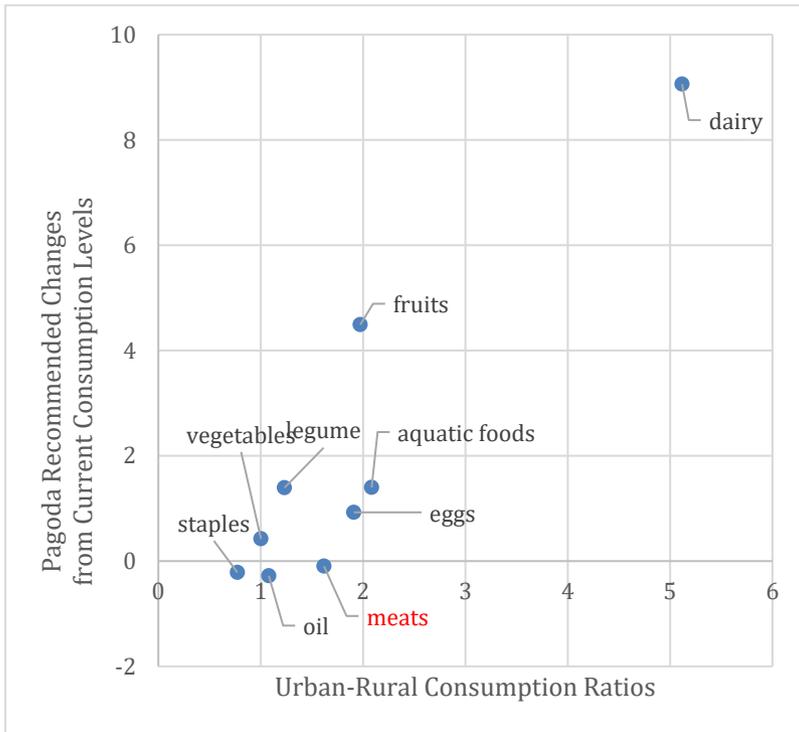


Figure 7. Scatterplot of Urban-Rural Consumption Ratios ( $x$ ) and Pagoda Recommended Changes ( $y$ )<sup>66</sup>

This strong correlation suggests that a specter is haunting the food pagoda – the specter of the city. In other words, the food pagoda tends to liberally recommend foods that are favored by urbanites, while at the same time discouraging foods that rural residents disproportionately consume. As a result, what appear as quintessentially Chinese urban foods such as dairy, fruits, and aquatic foods, are further valorized by the pagoda, whereas foods that are characteristically rural, e.g. staples, are presented as undesirable in the pagoda. As such, the food pagoda signals the people of rural China to look up to their urban counterparts for the ideal diet and encourages the people of urban China to continue in their current dietary trajectory. Perhaps inadvertently, the food pagoda may leave rural residents of China in a constant struggle to catch up with their urban counterparts, while neglecting—if not annihilating—the cultures and contexts of rural livelihoods, whatever the consequences

<sup>66</sup> See “2006 Zhongguo Weisheng Tongji Nianjian” (《2006 中国卫生统计年鉴》) [“2006 China Health Statistics Yearbook”], *supra* note 45; *China Statistical Yearbook 2019*, *supra* note 45.

for environment, health, and animal welfare. The health implications are especially significant, since the diet-related problems of urban China are precisely those due to the overconsumption of high-calorie fruits, high-protein aquatic foods, and high-fat dairy products.<sup>67</sup>

Our findings both confirm and challenge previous work on the subject. Past research has suggested that Chinese urbanites tend to better adhere to food pagoda recommendations than their rural counterparts.<sup>68</sup> Our results show similar correlational strength between urban status and the food pagoda's recommended dietary structure. However, our analysis leads us to consider the possibility that if there are causal relationships here of any sort, they may go both ways. In other words, in addition to urbanites adhering to the food pagoda more closely, the Chinese nutritionists who construct the food pagoda (themselves urbanites) may have encoded Chinese urban dweller preferences in the recommendations.

Yet, even when Chinese urban meat consumption is 162 percent of the rural amount, state nutritionists have prescribed reductions.<sup>69</sup> The fact that it is an exception to the general pattern of the food pagodas endorsing urban dietary trends is important. The public health implications of China's growing appetite for meat have become hard to ignore, especially in cities.<sup>70</sup> By 2007 the epidemiological evidence had convinced China's top nutritionists of the need to reverse course and limit meat intake.<sup>71</sup> Yet, as recently as 1997, the pagoda was telling people to consume more meat – 27.3 percent more to be exact—even though much of the increase in overweight began between 1989 and 1991 or even before.<sup>72</sup> It is easy for people to become confused when there are such rapid changes in recommendations, especially when they are made against the background of a food pagoda that overall still asks people to eat more of nearly everything.

### V. The Strange Case of Dairy

The most glaring feature of the food pagodas is their unrealistically high recommendations for the consumption of dairy products. The 1997 pagoda recommendation of 100 grams/day was

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<sup>67</sup> See Li et al., *supra* note 14, at 212-13.

<sup>68</sup> Xiaoyue Xu et al., *Do Older Chinese People's Diets Meet the Chinese Food Pagoda Guidelines? Results from the China Health and Nutrition Survey 2009*, 18 PUB. HEALTH NUTRITION, 3020, 3025-26 (2015).

<sup>69</sup> *Id.*

<sup>70</sup> Zhang et al., *supra* note 14, at 1983.

<sup>71</sup> *Id.*

<sup>72</sup> *Id.* The broader context of this meat anomaly warrants further discussion that we hope to pursue elsewhere.

nearly seven times the actual consumption level of 14.9 in 1992.<sup>73</sup> When the 2002 consumption figure went up to 26.5, Chinese nutritionists doubled down on their dairy recommendation, increasing the prescribed level to 300 grams/day.<sup>74</sup> Then, even after actual consumption declined to 24.7 in 2012, state nutritionists remain adamant in recommending 300 grams/day, or more than 12 times the average amount consumed (Figure 4).<sup>75</sup>

The food pagoda's fixation with dairy could seem improbable, especially since, historically, dairy has never been an integral part of the Chinese diet, with the exception of a small contingent of ethnic minority populations.<sup>76</sup> "Barbarian" nomadic groups such as Mongols and Tibetans are known to have depended on certain cattle breeds for meat and milk, giving substance to the general cultural association of dairy products with the "lack of civilization," as seen from the perspective of the Chinese Han ethnic majority.<sup>77</sup> But even for nomads, dairy consumption was commonly reserved for the brisk winters.<sup>78</sup> This historical experience with dairy, or lack thereof, is closely related to the common association between East Asia and the idea of "lactose intolerance." Medical scientists have been debating for decades the questions of whether "lactose intolerance" is biologically determined or culturally constructed, and of whether "lactose intolerance" is a misnomer to begin with.<sup>79</sup>

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<sup>73</sup> "Zhongguo Jumin Shanshi Zhinan" 1997 Nian Banben (《中国居民膳食指南》1997年版本) ["Dietary Guidelines for Chinese Residents" 1997 Edition], *supra* note 30.

<sup>74</sup> "Zhongguo Jumin Shanshi Zhinan" 2007 Nian Banben (《中国居民膳食指南》2007年版本) ["Chinese Resident Dietary Guidelines" 2007 Edition], *supra* note 31.

<sup>75</sup> Yiban Renqun Shanshi Zhinan (一般人群膳食指南) [Dietary Guidelines for the General Population], *supra* note 7.

<sup>76</sup> Mark Elvin, *The Technology of Farming in Late-Traditional China*, in THE CHINESE AGRICULTURAL ECONOMY 13-35 (R. Barker et al. eds., 1982); Jia-Chen Fu, *Confronting the Cow: Soybean Milk and the Fashioning of a Chinese Dairy Alternative*, in MORAL FOODS: THE CONSTRUCTION OF NUTRITION AND HEALTH IN MODERN ASIA 47, 47-65 (Angela Ki Che Leung et al. eds., 2019); Susan Glosser, *Milk for Health, Milk for Profit: Shanghai's Chinese Dairy Industry Under Japanese Occupation*, in INVENTING NANJING ROAD: COMMERCIAL CULTURE IN SHANGHAI, 1900-1945, 207-36 (S. Cochran ed., 1999).

<sup>77</sup> See Megan Tracy, *Pasteurizing China's Grasslands and Sealing in Terroir*, 115 AM. ANTHROPOLOGIST 437, 442 (2013).

<sup>78</sup> See Elvin, *supra* note 76.

<sup>79</sup> See Frederick J. Simoons, *Primary Adult Lactose Intolerance and the Milking Habit: A Problem in Biologic and Cultural Interrelations*, 15 AM. J. DIGESTIVE DISEASES 695, 695-710 (1970); Claude Fischler, *Food Habits, Social Change and the Nature/Culture Dilemma*, 19 SOC. SCI. INFO. 937, 937 (1980); Widjaja Lukito et al., *From 'Lactose Intolerance' to 'Lactose Nutrition'*, 24 ASIA PAC. J. CLINICAL NUTRITION 1, 1-8 (2015).

While the identification of lactose intolerance as a “medical deficiency” should be avoided, an estimated 95 percent of ethnic Han Chinese people are not genetically predisposed to digest milk.<sup>80</sup> Dairy marketing and recommendation in China, therefore, are up against the entire cultural and biophysical histories of the Middle Kingdom.

However, the peculiarity of the dairy recommendation begins to make sense, when it is situated in the context of China's experience with European modernity. The *en masse* arrival of European settlers and missionaries in the late 1800s and early 1900s gave dairy an unprecedented boost in China.<sup>81</sup> They brought with them, among other things, an entire suite of dairy technologies, regulations, and cultural values. As early as 1911, Chinese Customs official were predicting “enormous sale” of imported condensed milk to customers in China.<sup>82</sup> Dairy consumables took on fresh political and even ideological meanings in China, especially as their arrival coincided with the nation's search for its place in the colonial world order.<sup>83</sup> Frustrated by military defeats, territorial concessions, and declining cultural prominence, Chinese intellectuals debated heatedly about the underlying reasons for apparent Western superiority.<sup>84</sup> Shepherded by the commercial interests of the traders and compradors, who wielded enormous political influence, the intellectual crisis morphed into a wholesale obsession with Western science, commodities, health, and nutrition.<sup>85</sup> In this context, the line was blurred between national strength and personal health. A foreign, but nevertheless enviable, symbol of the Western diet, milk came to be seen as an essential ingredient in China's belated entry into modernity.<sup>86</sup> This led to the creation of a small Chinese dairy

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<sup>80</sup> Nissim Silanikove et al., *The Interrelationships Between Lactose Intolerance and the Modern Dairy Industry: Global Perspectives in Evolutional and Historical Backgrounds*, 7 *NUTRIENTS* 7312, 73161 (2015).

<sup>81</sup> See Thomas David DuBois, *Branding and Retail Strategy in the Condensed Milk Trade: Borden and Nestlé in East Asia, 1870-1929*, *BUSINESS HISTORY* (2019), <https://www.tandfonline.com/doi/abs/10.1080/00076791.2019.1688302>.

<sup>82</sup> See Thomas David DuBois, *China's Dairy Century: Making, Drinking and Dreaming of Milk*, in *ANIMALS AND HUMAN SOCIETY IN ASIA: HISTORICAL, CULTURAL AND ETHICAL PERSPECTIVES*, 179, 179–211 (Rotem. Kowner et al. eds., 2019).

<sup>83</sup> See LO SHUK YING (盧淑櫻), Muru Yu Niunai: Jindai Zhongguo Muqin Juse de Chong Su, 1895-1937 (母乳與牛奶: 近代中國母親角色的重塑, 1895-1937) [*MOTHER'S MILK AND COW'S MILK: REINVENTION OF MOTHERHOOD IN MODERN CHINA, 1895-1937*] (2018).

<sup>84</sup> See ROGASKI, *supra* note 4

<sup>85</sup> See Fu, *supra* note 76, at 47.

<sup>86</sup> See Xiaoqian Hu, “A Glass of Milk Strengthens a Nation.” *Law Development, and China's Dairy Tale*, 16 *J. FOOD L. & POL'Y* 78, 78 (2020).

industry, centered in the coastal cities and, more importantly, in the Northeast, an area greatly influenced by Russian refugees, first from the Great War, and then from the Bolshevik Revolution, who in some cases brought entire dairy herds with them.<sup>87</sup> Since then, China has continued to integrate dairy into its diet, gradually internalizing a form of “animal colonialism”<sup>88</sup> into the culinary map of the nation.

The political turmoil of the twentieth century notwithstanding, there was remarkable continuity in the promotion of dairy in China. In Republican and Communist periods alike, despite radically shifting winds in almost all other aspects of social life, dairy production and consumption were consistently celebrated as evidence of progress and prosperity.<sup>89</sup> Even under Japanese occupation in the 1930s and 40s, Chinese dairy entrepreneurs managed to enlist the support of authorities in expanding their businesses, owing to the successful framing of milk-drinking “as the key to China’s success in the evolutionary struggle to survive.”<sup>90</sup> The immediate post World War II period brought a flood of cheap milk powder from the United States, and dairy modernization was part of the first Five Year Plan after the birth of the “new China” in 1949.<sup>91</sup> Throughout the 1960s and 1970s the status of dairy remained high, though supply was limited.<sup>92</sup> Milk was classified as a “special commodity” and allocated primarily to soldiers, cadres, and to the young and old in urban areas.<sup>93</sup>

As the Chinese economy began to liberalize in the 1980s, the dairy industry received yet another boost with its association with western modernity, which has continued unabated.<sup>94</sup> A sign of milk’s current status can be seen in this advertisement from early 2020 which appeared on Shanghai television, featuring Princess Anne’s son, Peter Phillips, advertising milk from Jersey cows.<sup>95</sup>

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<sup>87</sup> See *The Dairy Market in China Will Be the World’s Largest by 2022*, DAXUE CONSULTING (June 1, 2020), <https://daxueconsulting.com/china-dairy-market/>.

<sup>88</sup> See Mathilde Cohen, *Animal Colonialism: The Case of Milk*, 111 AM. J. INT’L L. UNBOUND 267, 267–71 (2017).

<sup>89</sup> See Silankiove et al., *supra* note 80, at 7313-15.

<sup>90</sup> Glosser, *supra* note 76, at 209.

<sup>91</sup> See *A Look Through Time: Transformation of China’s Dairy Sector*, DAIRY GLOB. (Apr. 26, 2021), <https://www.dairyglobal.net/Market-trends/Articles/2021/4/A-look-through-time-Transformation-of-Chinas-dairy-sector-739294E/>.

<sup>92</sup> See *id.*

<sup>93</sup> See *id.*

<sup>94</sup> See *id.*

<sup>95</sup> Rebecca Taylor, *Queen’s Grandson Peter Phillips Flogs Royal Connections in Chinese Milk Ad*, SKY NEWS (Jan. 21, 2020), <https://news.sky.com/story/queens-grandson-peter-phillips-flogs-royal-connections-in-chinese-milk-ad-11913938>.



Figure 8. Chinese milk advertisement featuring Peter Phillips<sup>96</sup>

Nestle, which arrived in Shanghai in 1907, built its first factory in Shuangcheng in 1987, which opened in 1990.<sup>97</sup> The Swiss dairy giant has not only brought wholesale transformations to the local economy wherever it went, but also made rapid gains in market share. Advertisements for Nestle's infant formula was common in Chinese hospitals from the late 1990s into the first decade of this century.<sup>98</sup> By 1999, Nestle's total revenue of 13.3 billion US dollars was 74 times that of Shanghai Bright, one of the largest Chinese dairy

<sup>96</sup> Geroge Bowden, *Does a Milk Advert Show Harry and Meghan's Future?*, BBC NEWS (Jan. 22, 2020), <https://www.bbc.com/news/uk-51188894>.

<sup>97</sup> See NESTLÉ, *NESTLÉ IN CHINA CREATING SHARED VALUE 4* (2012), available at [https://www.nestle.com/sites/default/files/assetlibrary/documents/library/document%20s/corporate\\_social\\_responsibility/nestle\\_china\\_csv\\_report\\_2012\\_english%20version.pdf](https://www.nestle.com/sites/default/files/assetlibrary/documents/library/document%20s/corporate_social_responsibility/nestle_china_csv_report_2012_english%20version.pdf).

<sup>98</sup> Personal communication from Chun-mei Li to authors (March 2021). The government now encourages breast feeding but the law is relatively permissive with respect to advertising substitutes for breast milk. See Fang Jin, *Marketing of Infant Formula Must be Regulated*, CHINA DAILY, <http://global.chinadaily.com.cn/a/201905/09/WS5cd35d4fa3104842260ba9a5.html> (May 9, 2019).

firms.<sup>99</sup> Nestlé is now the largest food and beverage company in the Chinese market.<sup>100</sup>

While firms like Nestlé are at the forefront of Chinese dairy development, their success would not have been possible without the systematic backing of the Chinese state at all levels. The most significant piece of China's governmental push for dairy is the school milk program. It began piloting in five of China's most populated cities in 1999, promoting the centralized sales and distribution of ultra-pasteurized liquid milk to schoolchildren at the prescribed daily consumption level of 200 ml.<sup>101</sup> By 2020, the program covered a total of 26 million schoolchildren in more than 63 thousand schools all over the country, becoming a stable sales channel for 123 dairy firms that are enrolled as program suppliers.<sup>102</sup>

In numerous public reports and policy documents, the Chinese Dairy Association identifies rural China's low consumption of liquid cow milk as a sure sign of backwardness, hence targeted marketing in rural areas.<sup>103</sup> In school milk promotional materials, liquid cow milk is commonly depicted as a desirable way of life, an essential ingredient for student health, and a symbol of the modern economy.<sup>104</sup> The program is promoted through officially-endorsed press conferences, required health courses, student quizzes, radio programs, parent meetings, and even an annual School Milk Day.<sup>105</sup>

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<sup>99</sup> Huijun Zhang (张辉军), *Xibu Nai Ye Mianlin de Tiaozhan He Zhanlue Xuanze Challenges and Strategic Choices Faced by Western Dairy Industry* (西部奶业面临的挑战和战略选择) [*Challenges and Strategic Choices Faced by Western Dairy Industry*], GANSU NONGYE (1 甘肃农业) [GANU AGRICULTURE], no. 1 2001 at 59, 59-63.

<sup>100</sup> NESTLÉ, *supra* note 97, at 2.

<sup>101</sup> See *School Milk Programme Under Way*, CHINA DAILY (Nov. 21, 2001), <http://www.china.org.cn/english/SO-e/22455.htm>.

<sup>102</sup> Guoija "Xuesheng Yinyong Nai Jihua" Shishi 20 Nian Ji Xiandai Nai Ye Pingjia Tixi Jianshe Tuijin Hui Zai Beijing Longzhong Zhaokai (国家“学生饮用奶计划”实施20年暨现代奶业评价体系建设推进会在北京隆重召开) [*The 20th Year of the Implementation of the National “Student Milk Drinking Plan” and the Promotion Meeting for the Construction of a Modern Dairy Evaluation System Were Held in Beijing*], ZHONGGUO NAI YE XIEHUI (中国奶业协会) [DAIRY ASS'N OF CHINA] (Jan. 14, 2021), <https://www.dac.org.cn/read/newgndt-21011414300550910155.jhtm>.

<sup>103</sup> See *School Milk Programme Under Way*, *supra* note 101.

<sup>104</sup> Michaela Böhme, 'Milk from the Purest Place on Earth': Examining Chinese Investments in the Australian Dairy Sector, 38 AGRIC. & HUM. VALUES, 327, 330 (2020).

<sup>105</sup> See *School Milk Programme Under Way*, *supra* note 101.

In its push for uniformity and safety, the program only allows for packaged, ultra-pasteurized liquid cow milk with long shelf lives.<sup>106</sup> The government's promotion of this single product type has raised many controversies, especially in western regions where ethnic minority children are accustomed to drinking fresh dairy milk from local – if not their own – cattle farms.<sup>107</sup> Despite such pushback, the school milk program's nationwide endorsement has successfully enabled ultra-pasteurized milk to grow from obscurity to monopoly in China – commanding 77.3 percent of the market, according to a randomized household survey in 2014.<sup>108</sup> This figure can be corroborated by dairy firm earnings data, where sales of ultra-pasteurized milk contributed 64.2 billion RMB (approximately 10 billion USD) or 71 percent of the total revenue for Yili, the largest dairy conglomerate in China.<sup>109</sup> In the span of only two decades, China moved from localized, smallholder dairy operations to concentrated, industrial production of dairy by a handful of conglomerates.<sup>110</sup> When the industrialized model so easily takes over and becomes the norm of dairy-making, the entire dairy economy is built around the self-fulfilling prophecy of scale, quantity, and efficiency, leaving aside questions of animal welfare, sustainability, and well-being.<sup>111</sup>

The stunning growth of China's domestic dairy economy has provided the impetus and capital for global expansion. In recent years, as the Chinese economy grows beyond China, the dairy sector is at the forefront of global China's expansive reach. Under the rubric of the "Dairy Belt and Road," for example, Chinese state capital has been aggressively mobilizing domestic demand in order for state-backed dairy conglomerates to establish a truly global supply chain

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<sup>106</sup> *Id.*

<sup>107</sup> See Qiaoqiao Guan (关俏俏) & Jie Liu (刘杰), Xinjiang Xuesheng Nai Jihua Tuixing Shu Nian Zaoyu Ganga (疆'学生奶'计划推行数年遭遇尴尬) [*School Milk Programs Go Awry in Xinjiang*] (新疆'学生奶'计划推行数年遭遇尴尬), XXINHUA DIAO (新华调) INHUA (July 19, 2011), <https://news.qq.com/a/20110719/000959.htm>.

<sup>108</sup> Zhai Shixian (翟世贤) et al., *Shouru Zengzhang He Chengshi Hua Dui Yetai Nai XiaofeiinJiegou de Yingxiang* (收入增长和城市化对液态奶消费结构的影响) [*The Impact of Income Growth and Urbanization on Liquid Milk Consumption Structure*], 8 ZHONGGUO NONGCUN JINGJI (中国农村经济) [CHINESE RURAL ECON.] 45, 50 (2017).

<sup>109</sup> See Dairy Global, *The Dairy Market in China Will Be the World's Largest by 2022*, *supra* note 83.

<sup>110</sup> *See id.*

<sup>111</sup> CHRISTOPHER SCHLOTTMANN & JEFF SEBO, *FOOD, ANIMALS, AND THE ENVIRONMENT: AN ETHICAL APPROACH* (2018).

from New Zealand to the Netherlands.<sup>112</sup> Today the largest dairy farm in the world is the Mudanjiang City Mega Farm, located on the China-Russia border, which mainly supplies the Russian market.<sup>113</sup> It is an almost total confinement system in which its 100,000 dairy cows almost never see grass or experience daylight.<sup>114</sup> Outside China, in Chinese conglomerate Mengniu's "flagship" plant in New Zealand's Pōkeno Village, which has a population of approximately 400, the idyllic landscape has been forever transformed.<sup>115</sup> The plant's Chinese manager boasted that "when we came here in 2013, it was all pasture here. Within just six years, the population of Pōkeno has doubled, and the employment and infrastructure construction in town have also improved a lot".<sup>116</sup>

And yet, things are not so simple. According to China's official statistical yearbooks, since China's opening in the 1980s, meat and dairy production have increased enormously, still dairy follows its own distinctive course.<sup>117</sup> In the early 2000s, Chinese dairy output grew at a pace that exceeded that of all other animal protein sources. Yet, circa 2006, dairy output reached an inflection point and has since remained stable.<sup>118</sup>

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<sup>112</sup> See Yifei Li & Judith Shapiro, *Rethinking Extractivism on China's Belt and Road: Food, Tourism, and Talent, in OUR EXTRACTIVE AGE: EXPRESSIONS OF VIOLENCE AND RESISTANCE* 135, 138-42 (Judith Shapiro & John-Andrew McNeish eds., 2021).

<sup>113</sup> Amber Pariona, *Biggest Farms in the World*, WORLD ATLAS (Apr. 25, 2017), <https://www.worldatlas.com/articles/biggest-farms-in-the-world.html>.

<sup>114</sup> Qingcai Liu (刘清才) & Xin Qi (齐欣), "Yidai Yilu" *Kuangjia Xia Zhongguo Dongbei Diqu Yu Eluosi Yuandong Diqu Fazhan Zhanlue Duijie Yu Hezuo* ('一带一路' 框架下中国东北地区与俄罗斯远东地区发展战略对接与合作) [*Development Strategy Docking and Cooperation Between Northeast China and Russia's Far East Within the Framework of the Belt and Road Initiative*], 27 DONG BEI YA LUN TAN (东北亚论坛) [NE. ASIA F.], no. 2 (2018).

<sup>115</sup> See Jamie Gray, *Chinese Dairy Giant Mengniu Eyes Formula Expansion at Pokeno*, N.Z. HERALD (July 7, 2018), <https://www.nzherald.co.nz/business/chinese-dairy-giant-mengniu-eyes-formula-expansion-at-pokeno/Q6NFFTDcdf4OBMZGW6RCH7HJ2Y/>.

<sup>116</sup> *Yashili Factory Helps Reshaping Pokeno, a Small Town of New Zealand*, XINHUA (Oct. 14, 2019), [http://www.xinhuanet.com/english/2019-10/14/c\\_138470996.htm](http://www.xinhuanet.com/english/2019-10/14/c_138470996.htm).

<sup>117</sup> See *The Dairy Market in China Will Be the World's Largest by 2022*, *supra* note 87.

<sup>118</sup> See PWC, *THE ONGOING MODERNISATION OF CHINA'S DAIRY SECTOR* 4, 4 (2019), <https://www.pwccn.com/en/food-supply/publications/modernization-of-china-dairy-industry.pdf>.

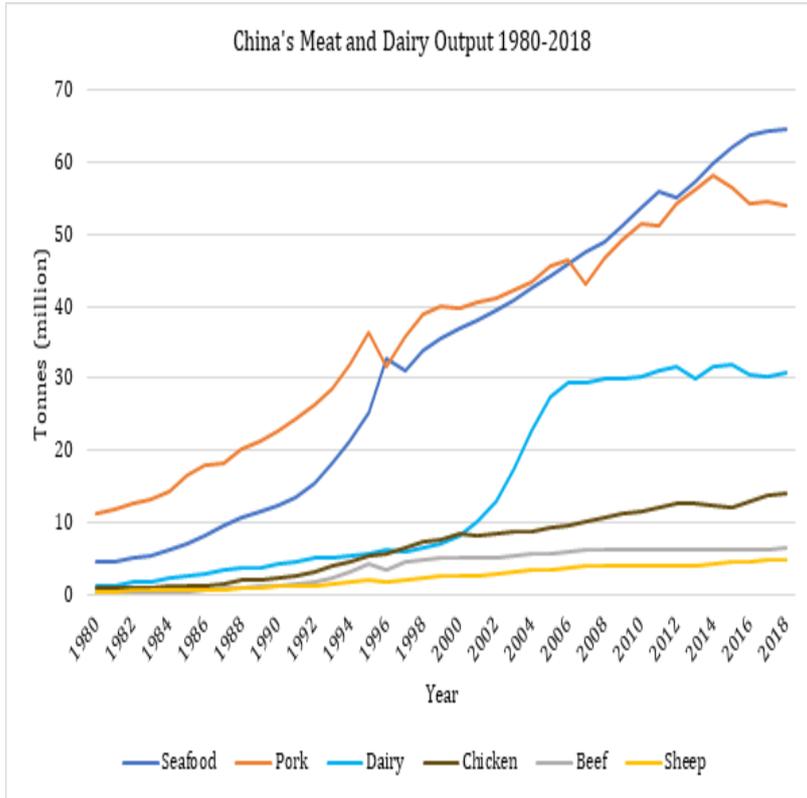


Figure 9. China's Meat and Dairy Output (1980-2018)<sup>119</sup>

Part of the explanation for this apparent anomaly is the dairy scandals of the first decade of this century and the resulting growth of dairy imports. The best known of these scandals came to light in 2008, and concerns the Sanlu Group, a state-owned Chinese dairy products company that produced one of the oldest and most popular brands of infant formula in China.<sup>120</sup> The company adulterated milk and infant formula with melamine in order to increase the nitrogen content of diluted milk, thus giving it the appearance of higher protein content, allowing it to pass quality control tests.<sup>121</sup> This

<sup>119</sup> *China Statistical Yearbook 2019*, *supra* note 45.

<sup>120</sup> See Echo Huang, *Ten Years After China's Infant Milk Tragedy, Parents Still Won't Trust Their Babies to Local Formula*, QUARTZ (July 16, 2018), <https://qz.com/1323471/ten-years-after-chinas-melamine-laced-infant-milk-tragedy-deep-distrust-remains/>.

<sup>121</sup> *See id.*

resulted in 300,000 illnesses, 54,000 hospitalizations, and 6 deaths.<sup>122</sup>

A consequence of these scandals was a massive increase in dairy imports, as Chinese consumer confidence in domestic products tanked.<sup>123</sup>

### China dairy imports, 1995-2013

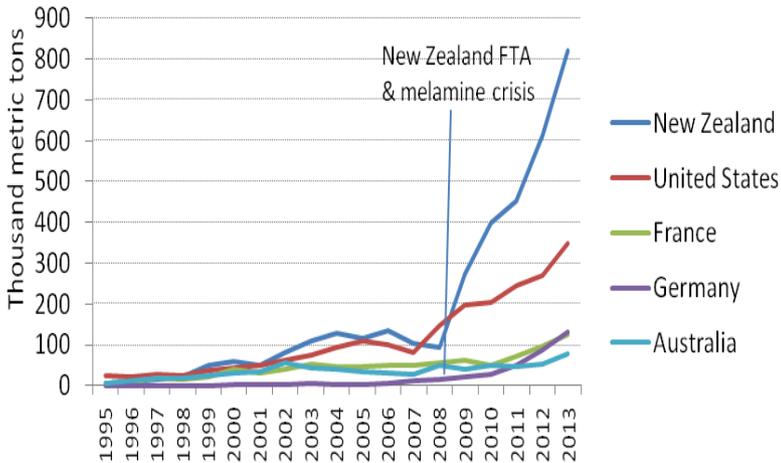


Figure 10. China's dairy imports (1995-2013)<sup>124</sup>

New Zealand has been the major beneficiary of this market shift, yet, ironically, a New Zealand company, Fonterra, owned 43% of Sanlu at the time of the scandal.<sup>125</sup> Fonterra's CEO was criticized both in the business press and by New Zealand's prime minister for his ethical failings, yet he went on to continue to have a distinguished

<sup>122</sup> See Xuli Wu et al., *Challenges to Improve the Safety of Dairy Products in China*, 76 TRENDS FOOD SCI. & TECH. 6, 8 (2018).

<sup>123</sup> See Yuting Wang et al., *Dynamic Analysis of China's Imported Raw Milk Powder Consumption*, 12 SUSTAINABILITY 1542, 1543-44 (2020).

<sup>124</sup> *Aussie FTA and Chinese Dairy Imports*, DIM SUMS BLOG (Dec. 26, 2014), <http://dimsums.blogspot.com/2014/12/aussie-fta-and-chinese-dairy-imports.html> (analyzing China customs data).

<sup>125</sup> See Edward Wong, *Company at Core of China's Milk Scandal Is Declared Bankrupt*, N.Y. TIMES (Dec. 24, 2008), <https://www.nytimes.com/2008/12/25/world/asia/25milk.html>.

career.<sup>126</sup> Sanlu executives were not so fortunate: two were executed and four others were imprisoned.<sup>127</sup>

Despite the long history of promoting dairy both by foreign companies and the Chinese state, the overall result is surprising. Dairy consumption has increased, but there has been nothing like the spike that has occurred with respect to meat. Moreover, in relative terms, China's per capita dairy consumption remains a fraction of that in industrialized economies. As the following figure shows, Chinese per capita consumption in whole milk equivalent is about 1/10 of that of the United States.

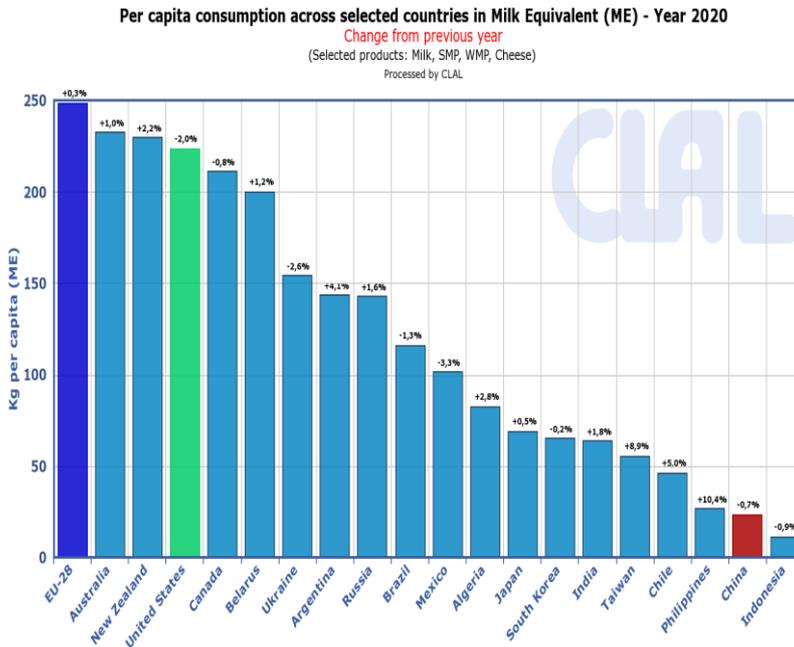


Figure 11. Per capita consumption across selected countries in Milk Equivalent (ME)

<sup>126</sup> See Van der Heyden to Step Down as Fonterra Chair, Norris Tapped, N. Z. HERALD (Nov. 16, 2011), <https://www.nzherald.co.nz/business/van-der-heyden-to-step-down-as-fonterra-chair-norris-tapped/IMO64UD6BDVNCG3IFVTQ634WDA/>.

<sup>127</sup> See Tania Branigan, China Executes Two for Tainted Milk Scandal, THE GUARDIAN (Nov. 24, 2009), <https://www.theguardian.com/world/2009/nov/24/china-executes-milk-scandal-pair>.

**NOTE:** Per capita consumptions of each country are obtained dividing total consumption (*Source FAS-USDA*) by the population (*Source FAO, Eurostat*).<sup>128</sup>

This makes it all the more puzzling why the food pagodas recommend such unrealistically high levels of dairy consumption, especially since, as we have suggested, they largely follow consumption rather than leading it. This becomes easier to understand when we see that the food pagodas are just one element of what we might call the “Chinese food/nutrition policy complex,” which consists of overlapping layers of authority that represent the internal checks and balances of the Chinese policymaking process.

The food pagodas overlap with several other guidance documents and policy instruments, including most notably the National Outline for Food and Nutritional Development (2014 to 2020)<sup>129</sup>, the National Nutritional Plan (2017 to 2030, with qualitative goals only; not included in Figure 12)<sup>130</sup>, and the Healthy China Action Plan (2019 to 2030, reiterating the goals in the national outline), as well as countless provincial and local mandates and directives on the same subjects.<sup>131</sup> Unlike the food pagoda, which is a public-facing document, these other elements in the policy-

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<sup>128</sup> *Per Capita Consumption*,

CLAL, [https://www.clal.it/en/index.php?section=tabs\\_consumi\\_procapite](https://www.clal.it/en/index.php?section=tabs_consumi_procapite) (Sept. 11, 2021).

<sup>129</sup> See generally Guowuyuan Bangong Ting (国务院办公厅) [Office of the State Council], *Zhong Guo Shi Wu Yu Yingyang Fazhan Gangyao (2014-2020 Nian)* (《中国食物与营养发展纲要 (2014—2020 年)》) [*China Food and Nutrition Development Program (2014-2020)*], ZHONGUA RENMIN GONGHEGUO ZHONGYANG RENMIN ZHENGFU (中華人民共和國中央人民政府) [THE CENT. PEOPLE’S GOV’T OF THE PEOPLE’S REPUBLIC OF CHINA] (Jan. 28, 2014), [http://www.gov.cn/zwgk/2014-02/10/content\\_2581766.htm](http://www.gov.cn/zwgk/2014-02/10/content_2581766.htm).

<sup>130</sup> See generally Guowuyuan Bangong Ting (国务院办公厅) [Office of the State Council], *Guomin Yingyang Jihua (2017-2030 Nian)* (《国民营养计划 (2017—2030 年) de Tongzhi》) [*National Nutrition Plan (2017-2030)*], ZHONGUA RENMIN GONGHEGUO ZHONGYANG RENMIN ZHENGFU (中華人民共和國中央人民政府) [THE CENT. PEOPLE’S GOV’T OF THE PEOPLE’S REPUBLIC OF CHINA] (July 13, 2017), [http://ww.gov.cn/zhengce/content/2017-07/13/content\\_5210134.htm](http://ww.gov.cn/zhengce/content/2017-07/13/content_5210134.htm).

<sup>131</sup> See Jiankang Zhongguo Xingdong Tuijin Weiyuanhui (健康中国行动推进委员会) [Health China Action Promotion Committee], *Jiankang Zhongguo Xingdong (2019-2030 Nian)* (《健康中国行动 (2019—2030 年)》) [*Healthy China Action (2019-2030)*], ZHONGUA RENMIN GONGHEGUO ZHONGYANG RENMIN ZHENGFU (中華人民共和國中央人民政府) [THE CENT. PEOPLE’S GOV’T OF THE PEOPLE’S REPUBLIC OF CHINA] (July 15, 2019), [http://www.gov.cn/xinwen/2019-07/15/content\\_5409694.htm](http://www.gov.cn/xinwen/2019-07/15/content_5409694.htm).

complex serve as the media by which government agencies communicate with each other internally.<sup>132</sup>

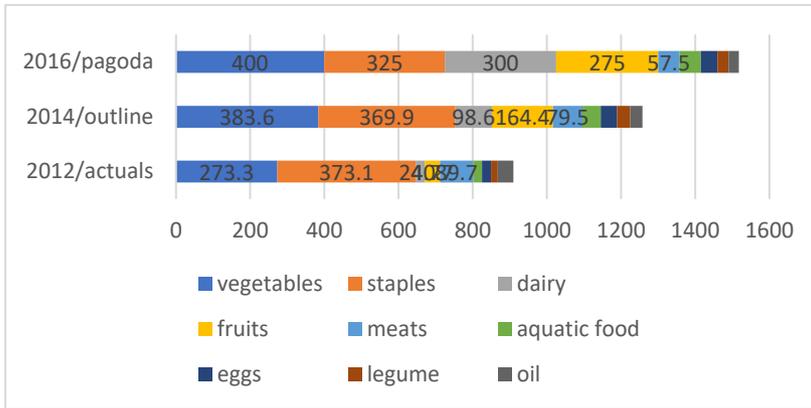


Figure 12. *Pagoda Recommendations, National Outlines, and Actual Consumption Levels of Foods in China (grams/day)*<sup>133</sup>

The national outline goals (Figure 12) are closer to actual consumption levels than those of the pagoda. In the case of dairy, for example, in contrast to the public-facing pagoda recommendation of 300 grams a day, the internal government target was only 98.6 grams for the years 2014 to 2020.<sup>134</sup> The pattern holds for other categories as well. Unlike public-facing goals in the pagoda, which are intended to be educational and aspirational, internal goals in the national outline are meant to be practical and actionable.<sup>135</sup> They represent an internal consensus across multiple government agencies from local to central levels. Moreover, unlike the food pagoda, the outline targets are binding, in the sense that officials are evaluated based on how their jurisdiction satisfies them.<sup>136</sup>

<sup>132</sup> See Guowuyuan Bangong Ting (国务院办公厅) [Office of the State Council], *supra* note 129; Guowuyuan Bangong Ting (国务院办公厅) [Office of the State Council], *supra* note 130; Jiankang Zhongguo Xingdong Tuijin Weiyuanhui (健康中国行动推进委员会) [Health China Action Promotion Committee], *supra* note 131.

<sup>133</sup> *China Statistical Yearbook 2019*, *supra* note 45.

<sup>134</sup> CHINESE NUTRITION SOCIETY, CHINESE DIETARY GUIDELINES 20 (2016).

<sup>135</sup> Pierre F. Landry et al., *Does Performance Matter? Evaluating Political Selection Along the Chinese Administrative Ladder*, 51 COMPAR. POL. STUD. 1074, 1075 (2017), <https://journals.sagepub.com/doi/10.1177/0010414017730078>.

<sup>136</sup> *See id.*

The discrepancy between these inward and outward-facing documents is an indication of the complex policy process at work in today's China, in which policy advisors strategically put forward an intentionally unrealistic "ask" in anticipation of an inevitable compromise down the road.<sup>137</sup> From this perspective, the dairy recommendations in the Food Pagoda can be seen as the nutritionists' "ask" in a complex policy-making environment. While nutritionists play an important role in advising policymakers, they do not themselves make policies. As such, their advice is juxtaposed and compared with advice from medical doctors, agriculturalists, statisticians, economic development specialists, and even trade advocates. This fragmented structure helps the Chinese state collect a wide range of inputs, but also means that the resulting policy is the product of compromises and trade-offs among different groups. In this context, advancing an unrealistically big "ask" in the public-facing food pagoda gives state nutritionists much-needed bargaining power in the policy process. Moreover, Chinese top nutrition scholars, like other policy actors, are influenced by their own values and interests, and the changing landscape of research funding, especially as dairy firms such as Danone and Nestlé fulfill their corporate social responsibility goals through dedicated streams of research spending.<sup>138</sup> 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 in building #3 of the complex on 2 Yuan Ming Yuan West Road in Beijing.<sup>139</sup>

The apparent disconnect of the food pagoda is thus a consequence of the layering of different interest groups and bureaucratic actors in Chinese politics. In other words, what is often dubbed the "policy implementation gap" is an inherent feature of the

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<sup>137</sup> See Xufeng Zhu, *Strategy of Chinese Policy Entrepreneurs in the Third Sector: Challenges of "Technical Infeasibility"*, 41 POL'Y SCI. 315, 319 (2008), <https://link.springer.com/article/10.1007%2Fs11077-008-9070-2>.

<sup>138</sup> Yang et al., *supra* note 34, at 909.

<sup>139</sup> See *Nai Chanpin Zhi Liang Yu Pinggu Keji Chuangxin Tuandui (奶产品质量与风险评估科技创新团队) [Dairy Product Quality and Risk Assessment Technology Innovation Team]*, ZHONGGUO KEXUEYUAN DONGWU KEXUE YANJIU SUO (中国科学院动物科学研究所) [INSTITUTE OF ANIMAL SCIENCES OF CAAS], <http://wztest0821.caas.cn/rctd/kytd/217524.htm> (last visited Oct. 16, 2021); *Zhongguo Nai Ye Xiehui Jiben Gaikuang (中国奶业协会基本概况) [Basic Overview of Dairy Association of China]*, ZHONGGUO NAI YE XIEHUI (中国奶业协会) [DAIRY ASSOCIATION OF CHINA], <https://www.dac.org.cn/normal/newxhjj.jhtm> (last visited Oct. 16, 2021).

central government's policy process, where the public-facing pledges and commitments run parallel to the government's internal action plans and strategies.<sup>140</sup> Outward-facing policies, such as the Food Pagoda, sketch out an aspirational image of the nation, whereas inward-facing documents define the day-to-day governance of China. The food pagoda, and its unrealistically high dairy recommendation is intended not as a set of rules for citizens to abide by on a daily basis, but as an aspirational statement that paints the picture of the ideal national diet in the eyes of China's modernization-driven policymakers. While the discrepancy in policy targets reflects the internal complexity of China's sprawling governing apparatus, they are in many ways disconnected from the social experience of food in China. This disconnect is most striking in the fact that, when it comes to actual dairy consumption, the Chinese people have thus far, largely ignored the efforts of both international marketers and the domestic food/nutrition policy complex.

## VI. Climate, Health and Animal Welfare

Thus far, we have shown that the goals, roles, and consequences of the Chinese dietary recommendations are more complex than might have been imagined. As we noted in Section III, what caught the world's attention in the 2016 food pagoda was its meat reduction recommendation and its potential impact on climate change. However, when the pagoda's recommendations are taken as a whole, their impact on climate change is much less positive than might have been thought.

The per capita emission reduction potential (0.386 kg CO<sub>2</sub>e/day) of China's proposed cut in meat consumption in 2016, for example, is more than wiped out by the additional emission (0.465 kg CO<sub>2</sub>e/day) of the proposed dairy increase alone. As Figure 13 shows, the CO<sub>2</sub> emissions of the food pagoda's recommended diet totals at 2.895 kg CO<sub>2</sub>e/day, reflecting a 31.3 percent increase from the observed emissions level of 2.204 kg CO<sub>2</sub>e/day in 2012. Taken together, the CO<sub>2</sub> implication of the food pagoda is net-positive: it increases emissions from the current dietary baseline. However, on a more optimistic note, compliance with the 2016 pagoda would decrease emissions relative to the 2007 pagoda.<sup>141</sup>

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<sup>140</sup> R. Ran, *Perverse Incentive Structure and Policy Implementation Gap in China's Local Environmental Politics*, 15 J. ENV'T POL'Y & PLAN. 17, 17 (2013), <https://www.tandfonline.com/doi/abs/10.1080/1523908X.2012.752186>.

<sup>141</sup> The GHG implications for different food categories are interpolated on the basis of prior research, which accounts for emissions associated with production, consumption, and waste of the average U.S. diet (Heller and Keoleian 2015), and

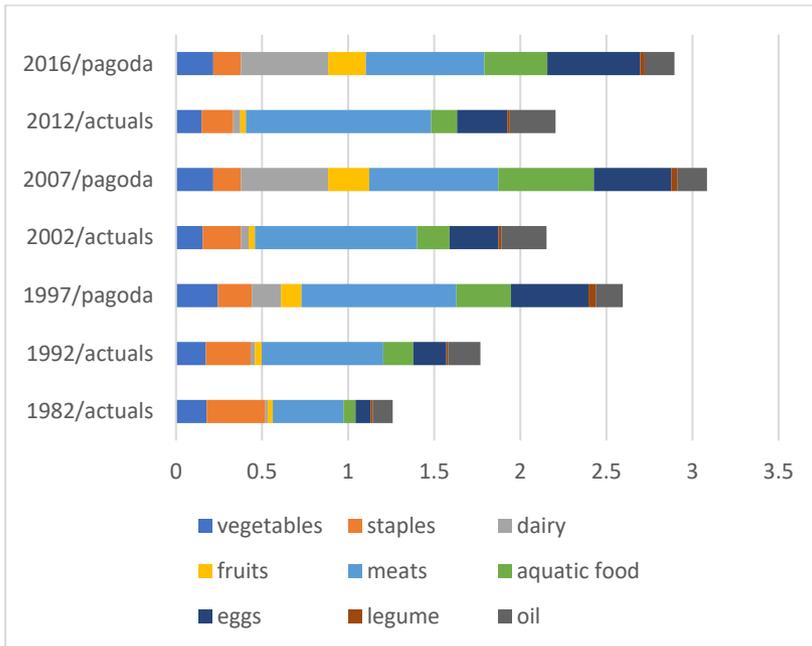


Figure 13. CO<sub>2</sub> Emissions of China's Diet, Observed Trends (1982, 1992, 2002, 2012) and Pagoda Goals (1997, 2007, 2016) (kg CO<sub>2</sub>e/day)<sup>142</sup>

As the actual Chinese diet has become lighter by weight (Figure 4), its CO<sub>2</sub> emissions have increased (Figure 13), due in large part to the shift toward carbon-intensive foods such as meats, aquatic foods, and eggs. Still, the actual consumption behavior of the Chinese people is more climate-friendly than what is recommended by the state.

adapted to the Chinese context in accordance with the Chinese Nutrition Society's (2021) recommendations. Martin C. Heller & Gregory A. Keoleian, *Greenhouse Gas Emission Estimates of U.S. Dietary Choices and Food Loss*, 19 J. INDUS. ECOLOGY 391, 391–401 (2014), <https://onlinelibrary.wiley.com/doi/10.1111/jiec.12174>; *Zhongguo Jumin Shanshi Zhinan 2021 Ban* (中国居民膳食指南 2021 版) [Chinese Residents' Dietary Guidelines 2021 Edition], ZHONGGUO YINGYANG XUEHUI (中国营养学会) [CHINESE NUTRITION SOCIETY], <http://dg.cnsoc.org/article/2021b.html> (last visited Oct. 21, 2021). The GHG coefficients and their derivative functions are recorded in Appendix A.

<sup>142</sup>See "2006 Zhongguo Weisheng Tongji Nianjian" (《2006 中国卫生统计年鉴》) ["2006 China Health Statistics Yearbook"], *supra* note 45; *China Statistical Yearbook 2019*, *supra* note 45.

While climate concerns do not figure into the construction of the pagodas, health is an important consideration. Exactly what conformity to the pagoda would mean in this regard is too complicated for us to address here. However, in a society with a growing obesity rate,<sup>143</sup> radically increasing dairy consumption while decreasing the consumption of staples would appear to be moving in the wrong direction. In addition to such direct health effects, animal agriculture produces indirect health effects that are often unnoticed. A paper currently under review shows that by driving increases in PPM2.5 pollution, there were about 66,000 premature deaths in 2010 alone as a result of the intensification of animal agriculture from 1990-2010.<sup>144</sup>

It is even more difficult to assess the full impact on animal welfare of the dietary recommendations, especially since consumption can drive production offshore as well as in country. Since becoming Brazil's largest trade partner in 2009, a position that had been long held by the United States, China has become the destination for increasing volumes of Brazilian shipments of soy and beef products, thus driving Amazonian deforestation in Brazil.<sup>145</sup> Current estimates suggest that the size of China's dairy herd will continue to decrease over the next few years but, due to imports, the impact on dairy cows globally may increase.<sup>146</sup> Even if the pagoda's recommended decreases in beef consumption were achieved, in terms of the total number of animals killed for food, it would be more than offset by increases in the consumption of aquatic animals. What is more likely to happen, in any case, is that the consumption of aquatic animals will increase and be added to further increases in meat consumption.<sup>147</sup> Already, as of 2018 China slaughtered more pigs, chickens, sheep, and fish than any other country, and was poised to surpass the United States with respect to cows.<sup>148</sup> In

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<sup>143</sup> See Sintia Radu, *China's Obesity Rate Triples in 10 Years*, U.S. NEWS & WORLD REP. (Oct. 28, 2019), <https://www.usnews.com/news/best-countries/articles/2019-10-28/obesity-rates-in-china-have-tripled-over-the-past-10-years>.

<sup>144</sup> See Xueying Liu et al., *Dietary Shifts Can Reduce Premature Deaths Related to Particulate Matter Pollution in China*, 2 NATURE FOOD 997 (2021), <https://doi.org/10.1038/s43016-021-00430-6>.

<sup>145</sup> Philip M. Fearnside, *Amazonian Forest Loss and the Long Reach of China's Influence*, 15 ENV'T, DEV. & SUSTAINABILITY 325, 325 (2012), <https://link.springer.com/article/10.1007%2Fs10668-012-9412-2>.

<sup>146</sup> See Heller & Keoleian, *supra* note 141.

<sup>147</sup> Richard York, *Poultry and Fish and Aquatic Invertebrates Have Not Displaced Other Meat Sources*, 4 NATURE SUSTAINABILITY 766, 766-68 (2021), <https://www.nature.com/articles/s41893-021-00714-6>.

<sup>148</sup> Bas Sanders, *Global Animal Slaughter Statistics & Charts: 2020 Update*, FAUNALYTICS (July 29, 2020), <https://faunalytics.org/global-animal-slaughter-statistics-and-charts-2020-update/>.

addition to concerns about the number of animals killed, Chinese law provides virtually no legal protection for animals used in agriculture.<sup>149</sup>

## VII. Concluding Remarks

In the opening chapter of his three-volume treatise entitled *General Plan for Nation Building*, the founding president of the Republic of China, Sun Yat-Sun, proudly proclaimed:

“All of China is culturally accustomed to vegetarianism. . . . By contrast, Europeans and Americans are in the fashion of carnivorousness and alcoholism, in spite of scientific advocacy on the one hand and regulatory prohibition on the other. . . . Chinese cultural customs of eating and drinking are assuredly superior to that of all other nations.”<sup>150</sup>

Sun arrived at this sweeping conclusion of national gastronomical superiority based on one single foodstuff—tofu. “Tofu is a must for the Chinese vegetarian diet; it is the plant-based equivalent of meat. It has all the benefits of meat, but none of its toxins,” Sun asserted.<sup>151</sup> To the “founding father” of modern China, tofu was the anchor of national identity.

China has no responsibility to “save the world,” but a nation that resists dairy, finds tofu as an anchor of its national identity, and whose dietary regulations call for a level of meat consumption that is 1/5<sup>th</sup> of that of North America and Australia, and about 1/4<sup>th</sup> of that of Europe, can provide important lessons to the world; and for China, this can be an important source of “soft power.” For this to occur, the food pagoda would have to become more coherent with respect to its impacts on climate, health, and animal welfare and also more efficacious with respect to behavior, at least with its recommendation to reduce meat consumption. Recommendations are not self-enforcing and it is the job of a government that organizes and administers a complex set of policies and negotiates competing interests to make recommendations real in everyday life. There is a widely held assumption—sometimes even hope—that China’s top-down political system can compel citizens and firms to adopt

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<sup>149</sup> See DEBORAH CAO, ANIMALS IN CHINA: LAW AND SOCIETY (2015); PETER J. LI, ANIMAL WELFARE IN CHINA 10-11 (2021).

<sup>150</sup> SUN YAT-SEN, GENERAL PLAN FOR NATION BUILDING (建國方略) (1917).

<sup>151</sup> *Id.*

sweeping changes in the interest of the common good simply by ordering them to do so. This is at best an illusion and at worst a delusion in most areas of life.<sup>152</sup> In any case the pagoda, in its political and bureaucratic contexts, turns out to be a remarkably soft instrument of public policy, adapting to, as much as challenging, the society's changing dietary patterns. The image of the Chinese government as a proactive, draconian climate defender does not hold up, at least not now, in the case of the food pagoda.

What our investigation shows is that the Chinese food/nutrition policy complex tends to frame rural China as a space that lags behind and needs to catch up with urban modernity.<sup>153</sup> But perhaps it is not rural China that has lagged behind, but rather urban-oriented food policies that are leading towards a dystopian future. With their dependence on plant-based food sources, preference for local supplies, attention to seasonality and active involvement in agricultural production, the rural people of China have wisdom, experience, and culture to offer. We are keenly aware of the danger in romanticizing rural ways of life, especially as growing numbers of Chinese urbanites flock to rural areas to get a taste of romantic rurality.<sup>154</sup> Much of this romanticizing reflects a jarring lack of evidence-based understanding of China's vast rural areas. However, future research would do well to examine more closely food, nutrition, sustainability and health in rural contexts.

Just as rural areas have much to offer to a rapidly urbanizing China, the country's own past also holds a rich repertoire of wisdom for living through the Anthropocene. In a rare display of internal dissent, Xianglin Xu, a seasoned economist at the Central Party School, wrote in criticism of the 1996 food pagoda that:

“the nutritionists’ proposal is incompatible with our national conditions. . . . Advocating for fully Westernizing our diet, [the food pagoda] tries to turn from plant-based food sources to animal ones, just like post-war Japan did. The result in Japan is that 60 percent of their caloric intake has become

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<sup>152</sup> See, e.g., Mark Beeson, *Coming to Terms with the Authoritarian Alternative: The Implications and Motivations of China's Environmental Policies*, 5 *ASIA & PAC. POL'Y STUD.* 34, 38 (2017), <https://onlinelibrary.wiley.com/doi/10.1002/app5.217>.

<sup>153</sup> See Afton Clarke-Sather, *‘But We Are the Most Backward’: Hierarchical Categorization of Modernity in Contemporary Chinese National Identity*, 83 *POL. GEOGRAPHY* 1,8 (2020), <https://www.sciencedirect.com/science/article/abs/pii/S0962629820303231>.

<sup>154</sup> See Choong-Hwan Park, *Nongjiale Tourism and Contested Space in Rural China*, 40 *MODERN CHINA* 519, 543 (2014).

import-dependent by the 1990s. ... It seems impossible for China to afford the same.”<sup>155</sup>

Xu’s dissent has gone unnoticed in the last two decades and a half. China’s policymakers are yet to fully appreciate the real costs of abandoning plant-based food traditions in favor of animal-based culinary modernity.

Still, there are hopeful signs from many different directions. The China Vegan Society launched in May 2021 in Yunnan.<sup>156</sup> Buying discounted foods close to their “sell by” dates is becoming common among young people.<sup>157</sup> The COVID pandemic gave many in China renewed impetus for moving toward a plant-based diet.<sup>158</sup> Nestle plans to build a plant-based meat factory in Tianjin.<sup>159</sup> As in the rest of the world, capital is beginning to move towards plant-based protein.

In the final analysis, the problem is not that the Chinese state has been slow to foster a healthy and sustainable diet for the nation of 1.4 billion, but rather that the state has sometimes acted too much and often incoherently.<sup>160</sup> On the receiving end of mixed, frequently changing signals, the people have not been presented with clear messaging about food that actually engages with the realities of everyday life. If the state can dial back its promotion of the modern, urban diet, and foster the rediscovery of the many centuries of culinary richness—let food be what it has always been in the Middle Kingdom: culture, tradition, and identity—then Sun Yat-Sun’s hope of becoming “assuredly superior to that of all other nations”<sup>161</sup> might

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<sup>155</sup> Xianglin Xu (徐祥临), *Dietary Guidelines Should Be Based on National Conditions* (制定膳食指南要符合国情), 18 *理论前沿* (1996).

<sup>156</sup> See Samantha J. Hind, *China Vegan Society: An Alternative Vegan Activist Approach*, *SURGE* (July 28, 2021), <https://www.surgeactivism.org/articles/china-vegan-society-an-alternative-vegan-activist-approach>.

<sup>157</sup> Phoebe Zhang, *Near-Expired Food Bargain Sales the Latest Trend in China as Beijing’s Anti-Waste Drive Picks up*, *SOUTH CHINA MORNING POST* (May 24, 2021), <https://sg.news.yahoo.com/near-expired-food-bargain-sales-090157739.html>.

<sup>158</sup> Pamela Lin, *Meatless Encounters*, *CHINA DAILY* (Sept. 18, 2020), <https://epaper.chinadaily.com.cn/a/202009/18/WS5f63fbf1a31099a2343506f4.html>.

<sup>159</sup> Wang Zhouquong, *Nestle Launches New Line of Plant-Based Food*, *CHINA DAILY* (Dec. 18, 2020), <https://www.chinadaily.com.cn/a/202012/18/WS5fdc740aa31024ad0ba9cb86.htm>.

<sup>160</sup> China is not alone in this. See, e.g., Maneesha Deckha, *Something to Celebrate?: Demoting Dairy in Canada’s National Food Guide*, 16 *J. FOOD L. & POL’Y* 11, 11-47 (2020).

<sup>161</sup> SUN, *supra* note 150.

just be within reach and, as a consequence, China may yet help to save the world.