EATING FOR TOMORROW

HOW CHINA’S FOOD CHOICES CAN HELP MITIGATE CLIMATE CHANGE

5 to do today
ABOUT 5 TO DO TODAY:

5 To Do Today is a campaign initiated in China to influence attitudes, motivate behavioral change and create support for climate action. We believe that individuals can make a significant, collective impact by modifying daily routines to reduce their environmental footprint.

Our mission is to minimize the impacts of climate change by urging individuals to reduce their energy use and overall resource consumption. The campaign asks all of us to take five simple actions every day to reduce energy use and consumption. The current focus is on transportation and food choices.

5 To Do Today is a campaign of WildAid, an organization which has a proven track record of success in influencing attitudes, inciting behavioral change, and creating collective support for action to protect endangered wildlife.

www.5todo.org

CONTACT INFORMATION:

5 To Do Today
333 Pine St. #300
San Francisco, CA 94104
Matt Grager
Climate Program Officer
grager@wildaid.org

PROJECT TEAM:

Betty Chong,
Climate Program Officer

Jenny Du,
Climate Program Officer

Matt Grager,
Climate Program Officer

Jaclyn Sherry,
Executive Assistant

Hugo Ugaz,
Graphic Designer

SPECIAL THANKS TO

EXECUTIVE SUMMARY

WHY EATING LESS MEAT MATTERS:

LIVESTOCK AGRICULTURE CONTRIBUTES 14.5% OF ALL GHG

Many experts predict that keeping global warming below the critical two degree Celsius threshold is impossible without a significant shift in diet.¹ Livestock agriculture produces more greenhouse gas (GHG) than all global transportation combined.² By 2050, the predicted increase in meat and dairy consumption would result in a further 80% growth of agriculture-related emissions.³

DEMAND IS RISING FAST

By 2050, rising incomes, growing populations and urbanization are projected to increase meat consumption by 76% and dairy consumption by 65%.⁴

LIVESTOCK AGRICULTURE DRIVES ENVIRONMENTAL CRISES

In addition to GHG emissions, livestock agriculture has significant environmental impacts, including deforestation, desertification, soil degradation and pollution, water pollution, ocean warming and acidification, ocean dead zones, and biodiversity loss. Deforestation and ocean warming further exacerbate climate change, while desertification and soil degradation can reduce agricultural output.

LIVESTOCK AGRICULTURE IS UNSUSTAINABLE

The world cannot meet the water and caloric needs of a growing population if current levels of livestock agriculture are continued. The practice involves 33% of all freshwater use, 30% of all ice-free land, 33% of all calories produced, and 50% of all protein, resources which all may be negatively impacted by climate change.⁵,⁶

WE CAN ACT NOW

Unlike reducing GHG emissions from energy or transportation, which require developing new technologies and building new infrastructure, reducing emissions from livestock agriculture can be immediately addressed at the individual level. Simple and direct steps, such as reducing portion size, eliminating food waste, substituting lower-carbon meats (e.g. chicken for beef) and increasing the number of meatless meals consumed can all help lower emissions.

LOWER EMISSIONS, BETTER HEALTH

The benefits of eating less meat go beyond the climate and environment – it can also improve your health. High meat consumption is linked to non-communicable diseases, such as diabetes, obesity, heart disease and cancer.

WHY CHINA CAN LEAD:

CHINA PLAYS A KEY ROLE

Due to its large population and rapid rates of economic growth, China is essential to any efforts to curb GHG emissions, especially from meat consumption, in which it already leads the world. China consumes 28% of meat and 50% of pork, globally.⁷⁻⁸ Beef consumption is expected to rise 47% by 2030. Yet China is new to mass meat consumption. Average per capita meat consumption has risen six-fold since 1978 to reach 63 kg and could rise another 30 kg by 2030.⁹

IT HAS INCENTIVE TO ACT

Reducing meat consumption can benefit China from a health, resource, climate and geopolitical perspective. Over 50% of the population is suffering from environmental-related illnesses, many of which are made worse by higher meat consumption, such as heart disease, obesity, cancer and diabetes. China has 20% of the global population, but 33% of the world’s diabetics.¹⁰ Child obesity has quadrupled in a single generation. The rising healthcare costs associated with these emerging crises will be significant.

IT HAS POLITICAL AND PUBLIC WILL

In May 2016, the Chinese Nutrition Society (CNS) issued its most recent ten-year dietary guidelines, which recommend reducing meat consumption by over 50%. A 2015 5 To Do Today survey showed that 83% of middle-class urban residents are willing to eat vegetarian at least one day each week, with 62% willing to do so at least two days per week. The survey also showed high awareness of the health impacts of meat consumption and moderate awareness of the environmental impacts.

AN OPPORTUNITY TO LEAD THE WORLD

Were the CNS dietary recommendations to be adopted nationally, emissions from meat consumption in China would decrease by an amount equal to 1.5% of global emissions or 6% of Chinese emissions. Without a dietary shift, emissions from meat consumption in China would rise over 50% by 2030 to equal more GHG than the 2012 national emissions of every country except China, the United States, India and Russia.
LIVESTOCK & GREENHOUSE GAS

As the main driver of climate change, greenhouse gas (GHG) emissions are typically associated with fossil fuels used for energy, transportation or industry. Greenhouse gases such as carbon dioxide, methane and nitrous oxide trap heat in the Earth’s atmosphere, thus raising the temperature of the planet. Though each of these gases traps heat at different rates, they are all calculated in their equivalent amount of carbon dioxide, known as the carbon equivalent (CO₂eq). For example, methane and nitrous oxide, two GHGs emitted during the livestock agriculture process, are 25 and 298 times more powerful than carbon dioxide, respectively.¹³

Many people will be surprised to learn that burning fossil fuels is not the only major source of GHGs. Emissions from livestock are calculated to be at least 14.5% of the global total.¹²,¹³ That is greater emissions than all of global transportation – more than every car, truck, train, plane and ship on Earth combined.

Animal feed production and the land-use change required for it accounts for 30% of all livestock emissions.¹⁴ The largest source (39%) is from enteric fermentation—the gaseous releases of cows and sheep.

Per unit of protein, beef, pork, and chicken emit 150, 25, and 20 times the GHG of soybeans.¹⁵ Because livestock emissions come mainly from large ruminant animals, the 60 billion chickens each year contribute only 10% of livestock emissions while the 1.4 billion cows contribute 66%.¹⁶ In addition to being less flatulent than cows or sheep, chickens convert feed more efficiently and use less land, both of which reduce their overall emissions.

“THE GHG CONTRIBUTIONS FROM LIVESTOCK ARE GREATER THAN EVERY CAR, TRUCK, TRAIN, PLANE AND SHIP ON EARTH COMBINED.”
MEAT ALONE CAN BUST THE CARBON BUDGET

Governments and experts, including the Intergovernmental Panel on Climate Change, have determined that the worst impacts of climate change are likely to be avoided if warming is stopped below two degrees Celsius above 19th century levels. Reducing emissions from our meat and dairy consumption is important not only because it represents a significant proportion of total emissions, but also because of how little GHG we can emit in the future while keeping warming below this limit. As it stands now, the world has already warmed a full one degree Celsius.\(^9\)

In order to understand how much GHG can be released and still stay below two degrees, the carbon budget was created. In order to have a likely chance (>66%) of staying below two degrees warming, the world can emit only 870 gigatonnes of CO\(_2\)eq (GtCO\(_2\)eq) between 2009 and 2100.\(^{20}\) With current annual global emissions hovering around 50 GtCO\(_2\)eq, the world will push past the two-degree threshold by 2030 without significant changes. One expert, Dr. Richard Oppenlander, goes so far as to say that even if livestock were the only source of GHG emissions, we would exceed the carbon budget as early as the 2030s.\(^{21}\)

While many people understand the importance of transitioning away from fossil fuels for energy production or transportation, few publicly suggest a similar shift away from meat consumption despite its annual contribution of at least 7 GtCo2eq.\(^{22}\) Compared to reducing the same amount from transportation, energy or industry, reducing emissions from agriculture requires little new infrastructure or technology. It could be accomplished immediately with a worldwide decision to shift away from meat consumption. For more information on mitigation scenarios in agriculture please see page 26.

*Soybean calculation reflects a no-tillage cultivation in moderately degraded savannah.
DEMAND FOR MEAT & DAIRY

Due to the growing population, rising incomes and urbanization, meat and dairy consumption are increasing around the globe. By 2050, meat and dairy consumption are expected to rise by 76 and 65% respectively,²³ contributing to an 80% increase in agricultural emissions.²⁴ These emissions, plus the requirements for large amounts of land, water and crops to raise livestock, makes the growth of meat consumption unsustainable.

This increase is happening fastest in developing countries as a part of a larger trend known as the nutrition transition. Meat consumption in western countries remains higher per capita, but has mostly plateaued or even declined slightly.²⁵ The nutrition transition occurs because rising incomes allow developing countries to afford higher-priced food, which often includes less whole foods and more food prepared outside the home. Urbanization combined with global trade also makes Western-style diets more common, as they are better marketed and cheaper than ever before.

Due to the combination of high population and increasing per capita consumption, China will be the largest source of increased demand. It currently consumes twice the amount of the second place United States and is projected to triple the US total by 2030. Even Brazil, where per capita consumption doubled from 40 kg to over 80 kg since 1980, represents only a small fraction of the total demand in China.²⁶

Increased demand for livestock is not new. Over the fifty years between 1960 and 2010, global meat production rose from 150 million tonnes to 300 million tonnes, while average consumption quadrupled from 10kg to over 40kg.²⁷ In order to meet rising demand for livestock products, the world has had to produce more crops by


FIG. 3: ANNUAL MEAT & DAIRY CONSUMPTION BY COUNTRY (1,000S OF TONNES)
increasing yields per hectare and cultivating more land, neither of which will be feasible in the near future. The Green Revolution increased yields in the 1960-80s by creating and mainstreaming genetically modified crops, pesticides and chemical fertilizers, while deforestation made the necessary farmland available. Further deforestation will cost the planet vital carbon sinks and storage, while additional chemical inputs could degrade critical topsoil that is already overstressed in addition to contributing its own GHG emissions.

**MEAT CONSUMPTION IN CHINA**

Since 1978, the average annual income in China has grown from $200 to $6,000. The average Chinese consumer now eats 63 kg per year, six times as much as in 1978, and consumption is predicted to rise an additional 30 kg by 2030. This growth is happening four times faster than the next fastest-growing consumer, Brazil. China now consumes 28% of the world’s meat and dairy products and half of its pork. The predicted rise in per capita consumption would be the equivalent of adding another United States to total global demand for meat and dairy products by 2030.

The study that predicts a 30 kg increase also predicts that beef consumption will make up 10% of that rise, from 5 kg per year per person in 2010 to 8 kg in 2030. This rise would mean an additional 233 megatonnes (MtCO₂eq) in GHG emissions annually. The predicted 20 kg rise in pork consumption by 2030 would add an estimated 244 MtCO₂eq to annual GHG emissions. Out of three recent projections for per capita demand for meat in China in 2030, two would result in an increase in GHG emissions from meat consumption of over 50%. For more information on GHGs from meat consumption in China see page 26.
With demand for meat and dairy set to rise by 76 and 65%, what will it take in terms of land, crops and water to meet the demand for livestock of 9.7 billion people in 2050 and 11.2 billion by 2100?37

Whether looking at land, water and crops individually or as an ecosystem it is clear that there will not be enough resources to meet the growing demand for livestock agriculture if feeding the growing population is also to be achieved.

As with the crop and water inputs, more land is required to produce beef than any other meat, at 30 square meters per kilo. Both chicken and pork require approximately 20 square meters, still much higher than soy, fruits, potatoes and vegetables, which require less than two square meters.38 In aggregate, the large land use requirements for livestock presents many challenges, especially as demand for meat and dairy grows.

Livestock agriculture uses 70% of all agricultural land and 30% of all the ice-free land on Earth.39 If the entire global population were to eat the average North American diet, the resulting tripling of animal-based protein consumption would require at minimum a doubling of cropland.40 By 2050 an area of forests the size of India will have been purposefully deforested mainly for agriculture, releasing over 100 GtCO₂eq, or one-sixth of the planet’s remaining carbon budget.41

**LAND USE ISSUES IN CHINA:**

- China has 20% of the world’s population but only 7% of its arable land.42
- Each year, 400 million people in China are affected by desertification, which caused 24,000 towns and villages to vanish between 1950 and 2000.43
- In 2008, an official survey estimated that China was losing 4.5 billion tons of topsoil annually due to wind and water erosion, or five times as much as was lost annually during the US dustbowl of the 1930s.44 China now has half the arable land per person compared with 50 years ago.
- As China has run out of arable land to grow feed at home, it has begun buying and leasing farmland overseas. In 2012, the International Institute for Sustainable Development reported that it identified 54 Chinese overseas agricultural projects totalling over 18,000 square miles—an area 40% larger than Taiwan—in countries ranging from Ukraine to Zimbabwe.45

**DEFORESTATION**

Livestock agriculture contributes to deforestation in three ways. First, forests are often cleared for grazing. This is the number one cause of deforestation in nearly every Amazon country, and accounts for at least 70% of Amazon forest loss.46 Second, forests must be cleared to grow crops, mainly soy, used to feed livestock. Lastly, by causing general climate change, the GHG emissions from livestock accelerate forest loss already underway.

Livestock agriculture has had a significant impact on the world’s forests, particularly in Central and South America. In the past 40 years, over 40% of Central American forests have been cut down and an area of rainforest twenty times larger than Taiwan has been cleared from the Amazon, predominantly for livestock and its feed.47 A further seven football fields worth of land is cleared every minute to make room for livestock.48
EATING FOR TOMORROW

FIG. 5: CAUSES OF DEFORESTATION IN THE BRAZILIAN AMAZON 2000–2005
Source: H.K. Gibbs, 2009

LAND DEGRADATION

Livestock agriculture contributes to other forms of land degradation, including desertification and soil degradation, which reduce the available space and nutrients needed for growing food.

Each year, 20 million acres of arable land are lost to desertification, 35 times the historical rate.\(^5^0\) Livestock agriculture is responsible for about one-third of this total loss, or an area only slightly smaller than Hainan Island. In that last 40 years, nearly one-third of the world’s arable land has been lost, and 25% of the Earth’s total land area is now either highly degraded or currently undergoing high rates of degradation.\(^5^1\)

The land lost to desertification and degradation directly diminishes a key resource for food production. Total land lost to degradation dating back to only 1995 would be sufficient to feed the current global population a plant-based diet year-round.\(^5^2, 5^3\)

A soy plantation intrudes into the Brazilian Amazon rainforest. Chinese imports account for 64% of the global soy trade and grew 253% between 2003 and 2012. Soybean meal, an ingredient in animal feed represents nearly 80% of Chinese soy imports.\(^4^9\) Photo: Alamy

20–25%
SMALL-SCALE AGRICULTURE

2–3%
LOGGING

1–2%
OTHER

5–10%
LARGE-SCALE AGRICULTURE

65–70%
CATTLING RANCHING

“BY 2050 AN AREA OF FORESTS THE SIZE OF INDIA WILL HAVE BEEN PURPOSEFULLY DEFORESTED MAINLY FOR AGRICULTURE.”
WATER SUPPLY

In total, one-third of all freshwater used globally is for animal agriculture.\(^5^\)\(^4\) Agriculture overall is responsible for 70% of all freshwater use and 93% of global water depletion. By 2030 humanity’s annual global water requirements will rise by 50% and exceed sustainable water supplies by 40%.\(^5^\)\(^5\), \(^5^\)\(^6\) The meat and dairy we put on our plate are inextricably linked with the exploitation of this resource.

As with all other inputs, water usage varies depending on the type of livestock. Switching from beef, the largest user at over 15,000 liters of water per kilogram of meat, to any other type of meat does more for the planet than switching from any other type of meat to plant-based proteins. Compared to cereals, beef, pork and chicken use 9, 4 and 3 times as much water per kilogram.\(^5^\)\(^7\)

The World Bank predicts that 2.8 billion people will live in regions with absolute water scarcity by 2025.\(^5^\)\(^8\) Yields from rainfed agriculture, which supplies 60% of the world’s food,\(^5^\)\(^9\) are predicted to be down by 50% as early as 2020 due to climate change.\(^6^\)\(^0\)

Up to one third of the world’s largest aquifers are already being drained faster than they are replenished, most of them concentrated in food producing regions that support over 25% of the planet.\(^6^\)\(^1\)

The food sector is responsible for about half of all organic water pollutants. In developing countries, up to 90% of waste water, including that which results from agriculture, flows untreated into oceans, lakes, rivers and streams.\(^6^\)\(^2\)

WATER ISSUES IN CHINA

- China irrigates over half its farmland, five times as much as the US.\(^6^\)\(^3\) Agriculture uses more than 60% of water in China. Official government estimates say that 55% of this water is lost through leakage in the system, meaning as much as 33% of all China’s water is wasted through leakage in an inefficient agricultural system.\(^6^\)\(^4\) Many major cities in China, including Beijing, which has experienced 31 consecutive years of drought, are suffering from rapidly falling water tables and subsidence.\(^6^\)\(^5\)

- China has less than one-third the global average of per capita water resources.\(^6^\)\(^6\)

- One-third of all major rivers and 60% of all groundwater are polluted, which has resulted in 300 million people drinking contaminated water and almost 200 million suffering from water-related illnesses annually between 2007 and 2012.\(^6^\)\(^7\)

- Agriculture is responsible for 42% of water pollution in China, and 67% of both nitrogen and phosphorus discharge, pointing to over-use of fertilizer and pesticides as well as poor manure management practices.\(^6^\)\(^8\)
FOOD SUPPLY

Currently, 25% of all crops, 33% of all calories and 50% of all protein globally go to feed livestock. Livestock animals consume 40-50% of global corn production and 80% of soy. By 2050, as much as 50% of crops will be fed to livestock while climate change threatens to reduce yields by between 13 and 50% in the same time frame.

In the context of world hunger and food security, grains fed to livestock are misallocated. 82% of undernourished people live in countries that export livestock or export crops for livestock feed. In 2013, scientists from the University of Minnesota concluded that if all food crops were fed directly to humans rather than livestock, 70% more food could be added to the global supply. This supply would be enough to feed an additional four billion people - the same number of people the UN estimates will be added to the global population by 2100.

The world currently produces enough crops to provide every person with a daily diet of 2,700 calories.

CROP ISSUES IN CHINA

- In 2011, China used approximately 70% of its total corn production for livestock feed and only 5% for food.
- China will have a deficit of 19-32 million tons of corn by 2022, requiring imports approximately equal to a third of the entire world corn trade today.
- China will account for 40% of the growth in agricultural imports between now and 2050.
- Only 12% of total cereals are traded on the global market, of which China is the largest buyer. Total soy imports increased by 253% from 2003-2012, making China the largest importer of soy, with purchases on the global market 5 times larger than the next largest importer, the EU.
RISKS TO HUMAN HEALTH

Meat plays a central role in most traditional and modern food cultures, and consumption continues to grow in many developing countries. With that growth comes a number of related health issues. Risks of cardiovascular disease, obesity, diabetes and cancer all increase with higher levels of meat consumption. Dr. Frank Hu of Harvard University School of Public Health wrote that there is "clear evidence that regular consumption of red meat, especially processed meat, contributes substantially to premature death."[80]

On average, vegetarian men live 9.5 years longer than male meat-eaters, and women 6.1 years longer.[81] Vegetarians have also been shown to be 32% less likely to develop heart disease, 40% less likely to develop cancer, have a lower risk of diabetes and have a lower body mass index (BMI).[82] The lower BMI is not attributable to eating less overall, as a 2010 study showed that even between people who consume the same amount of calories, the meat consumer will gain an additional 2kg over five years compared to the vegetarian.[83] This helps explain why on average adult vegans are 4.5 to 9 kg lighter than adult meat-eaters.[84]

HEALTH IMPACTS IN CHINA

As meat consumption grows in China, so too do the related health problems. According to the Chinese Nutrition Society, the biggest health problems in China are obesity, diabetes, hypertension, high salt intake, and nutrient deficiency. In 2010, 85% of deaths in China were the result of non-communicable diseases,[85] including many of those listed above. Globally, the average is 60%. Many of these diseases, such as high blood pressure, heart disease, diabetes and several forms of cancer are linked with the over consumption of meat.

China is home to over 100 million diabetic patients, more than any other country. In the adult population, 11% suffer from diabetes.[86] "Like their American counterparts, more processed food, more meat, more oils, fats and sugars are making Chinese children dangerously overweight."

FIG. 10: OVERWEIGHT POPULATION IN CHINA

Source: University of Washington, Institute of Health Metrics and Evaluation
Non-communicable diseases such as diabetes, cancer, hypertension and obesity cause 85% of deaths in China, 25 percentage points higher than the global average. As a result, the percentage of national healthcare expenses used to treat diabetes in China rose from 1.96% in 1983 to 18.2% in 2007.

The average Chinese person is now 8 to 15 kg heavier than a generation ago. Obesity is defined as a BMI of over 30, while overweight falls between 25 and 30. China is now home to the second most obese individuals after the US, which has 62 million.

Meat consumption can also combine with environmental factors to undermine human health. In China, at least half of the population is suffering from chronic and environmental related illnesses while 200 million more are directly exposed to occupational hazards.

Like their American counterparts, more processed food, more meat, more oils, fats and sugars are making Chinese children dangerously overweight. In Beijing, Chongqing and Shanghai, children now consume nearly 30% of their calories from processed packaged foods. Between 1980 and 2013 the rate of children that are overweight quadrupled to 20% and the rate of pre-diabetic children rose to 15%. Chinese adolescents now have a diabetes rate three times that of their US peers. Partly due to the growth in childhood obesity, China could be home to 800 million overweight or obese citizens by 2030.

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ON AVERAGE, VEGETARIAN MEN LIVE 9.5 YEARS LONGER THAN MALE MEAT-EATERS, AND WOMEN 6.1 YEARS LONGER.
OTHER IMPACTS OF LIVESTOCK

OCEAN DEAD ZONES
Modern livestock agriculture has not only transformed the terrestrial landscape, it is also rapidly changing our oceans. In addition to the problem of overfishing, the planet’s marine ecosystems are coping with acidification and a growing number of dead zones, the primary cause of which is nitrogen and phosphorous from agricultural runoff. Dead zones have doubled in frequency every 10 years since the 1960s and now number more than 400 worldwide, including a 5,000 square mile dead zone in the Gulf of Mexico caused by agricultural and industrial runoff from the Mississippi River; and, a 145,000 square mile dead zone in the Baltic Sea. China’s Bohai Sea is also considered a dead zone. Despite the fact that 20% of the nations sewage is dumped there, its main pollutant source is runoff from fertilizer. In total, ocean dead zones now cover over 1.7 million square miles, or an area the size of South Asia, including Bangladesh, India, Nepal, Pakistan and Sri Lanka.

BIODIVERSITY LOSS
Over the 3.5 billion year history of life on Earth, there have been five major extinction events in which the variety and number of living species have dropped dramatically, up to 90%. Scientists now agree that the planet is currently in the middle of the sixth major extinction event, and tellingly, that humans are its cause.

Scientists call this the Anthropocene, the epoch where humans have wielded the power to alter the environment on Earth significantly. Humans have transformed the landscape, added GHG and pollutants to the air, changed weather patterns, and increased the temperature and sea level. In this process, we increased the rate of
An endangered golden snub-nosed monkey bares its teeth in the Qinling Mountains of China. It is estimated that only 3,000 of the species remain due to habitat loss, including deforestation. Photo: Alamy

**CLIMATE CHANGE IMPACTS IN CHINA**

The combination of a large population concentrated on the coast, a relative lack of arable land and persistent water issues make China particularly vulnerable to climate change, especially as it relates to food security. China’s own National Development and Reform Commission acknowledged the following in a December 2013 Report:

“Our country is a developing nation with a large population, complex climate conditions and a weak environment (situation). The mission to deal with climate change is particularly arduous, but knowledge in society and ability to do this are weak across the board.”

Zheng Guoguang, director of China’s meteorological administration, reported in early 2015 that among the most pressing climate related issues in China will be food insecurity, extreme weather, cities at risk of submersion, and the spread of illnesses, including dengue fever and malaria.

Other climate change impacts in China include:

- Approximately 85 million people in China currently live on land that will be submerged or chronically flooded by 2100. Due to urbanization, the population growth of coastal cities is occurring three times the national rate and could reach between 200 and 245 million by 2060.
- By 2050, 40 to 200 million people could be internally displaced within China due to climate change.
- Temperatures on the Tibetan Plateau are rising at a rate over four times faster than the global average, partially due to its arid elevation and partially due to the loss of reflectivity from rapidly melting glaciers, which are expected to be 50% depleted by 2100. The 1.5 billion people who receive their water supply from these glaciers will increase to 2.2 billion by mid-century. In the short term this glacial melt will increase the outflow of some of the world’s major rivers, including the Yangtze and Yellow rivers in China, the Brahmaputra, Ganges and Indus in India, and the Irrawaddy and Mekong in Southeast Asia, until approximately 2050. However, combined with more unpredictable monsoon seasons, an increase in glacial melt will likely result in substantial flooding rather than alleviating water shortages.
- Globally, climate change will increase the frequency, severity and unpredictability of natural disasters that include floods, droughts and storms. Recent experiences can be expected to continue in China where the number of natural disasters from 2000-2014 rose 57% from the previous 15-year period.

Habitat destruction from grazing livestock and feed crops impacts 86% of threatened mammals, 88% of amphibians and 86% of all birds. Further estimates are that one in eight birds, one in four mammals and one in three amphibians are facing an extremely high risk of extinction in the near future. According to the Alliance for Global Conservation, 36% of all species on Earth are now threatened with extinction. Livestock agriculture also contributes to biodiversity loss in other ways, including the hunting of predator species, such as wolves or jaguars, to protect livestock and the use of pesticides, herbicides and chemical fertilizers that pollute the environment, interfere with animal reproduction and poison waterways.

extinction to between 1,000 and 10,000 times its predicted level without human interference (the background rate). This is the largest extinction event since a meteor wiped out the dinosaurs 65 million years ago and continues to exterminate 137 species every day.

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SURVEY FINDINGS

AWARENESS, ATTITUDES & HABITS IN CHINA:

In December 2015, 5 To Do Today commissioned Ipsos to conduct a direct interview 700-person survey across 11 Tier 1 and Tier 2 cities in China, and Intage to conduct a broader online survey of 5,000 people across 13 Tier 1, Tier 2 and Tier 3 cities.

KEY FINDINGS:

- 98% of survey respondents had eaten meat in the last month.
- 95.3% had eaten eggs, while 87.2% had consumed dairy products.
- Online, 6% reported being vegetarian. Of the non-vegetarians, 64% considered their meat consumption to be at “normal levels.”
- 19.2% of men and 13.7% of women dined out more often than they dined at home. Younger people reported dining out more often than older ones.

FINDINGS: DECISION-MAKING

FIG. 11: FACTORS CONSIDERED IN FOOD CHOICES

<table>
<thead>
<tr>
<th>Factor</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Nutrition</td>
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<tr>
<td>Taste</td>
<td>29%</td>
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<tr>
<td>Food Safety</td>
<td>15.7%</td>
</tr>
<tr>
<td>Price</td>
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<tr>
<td>Organic</td>
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</tr>
<tr>
<td>In-season</td>
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<tr>
<td>GMO</td>
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<tr>
<td>Location</td>
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FINDINGS: IMPACT AWARENESS

FIG. 12: PERCENTAGE OF RESPONDENTS AWARE OF THE IMPACT OF LIVESTOCK ON THE FOLLOWING ISSUES:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Offline</th>
<th>Online</th>
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<tbody>
<tr>
<td>Health</td>
<td>88.1%</td>
<td>88%</td>
</tr>
<tr>
<td>Crop &amp; Land Resources</td>
<td>59.7%</td>
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</tr>
<tr>
<td>Water Resources</td>
<td>49.8%</td>
<td>63%</td>
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<tr>
<td>GHG Emissions</td>
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<td>54%</td>
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<tr>
<td>Mitigating Climate Change</td>
<td>36.7%</td>
<td>50%</td>
</tr>
<tr>
<td>Deforestation</td>
<td>35.6%</td>
<td>48%</td>
</tr>
<tr>
<td>Ocean Dead Zones, Habitat Loss, Species Extinction</td>
<td>35.6%</td>
<td>49%</td>
</tr>
</tbody>
</table>
FINDINGS: MOTIVATIONS

FIG. 13: WHY PEOPLE ARE WILLING TO EAT LESS BEEF AND/OR LAMB

- Health: 81.9%
- Climate change: 45.2%
- Animal welfare: 38.9%
- Reduce food cost: 24%
- Fashionable: 4.15%

FINDINGS: BEHAVIOR CHANGE

FIG. 15: WILLINGNESS TO REDUCE BEEF AND LAMB CONSUMPTION

- 64.6%: Yes
- 35.4%: No

FIG. 14: WHY PEOPLE REFUSE TO EAT LESS BEEF AND/OR LAMB

- Bad nutrition: 34.5%
- Meat lover: 30.5%
- Bad for health: 28.8%
- No climate change: 23.5%
- Lifestyle: 4.15%
Halting global warming below the critical threshold of two degrees Celsius will require a dramatic decrease in GHG emissions from all sectors. For a 66% chance of achieving this goal, we will need to reduce annual emissions by 30% by 2030, and 60% by 2050. This effort is complicated by the addition of two billion more people by 2050. More dramatic reductions in the short term will ease the cost and pain of long-term reductions. The sooner we act, the less dramatic the action need be.

In late 2015 two key analyses were released regarding the potential to mitigate climate change by changing what we eat. Both studies found that reaching the two degree Celsius goal may be impossible without dietary change. The studies found:

- “Immediate and substantial reduction in wasted food and meat and dairy intake, particularly ruminant meat (e.g., beef and lamb), are imperative to mitigating catastrophic climate change.”

![Protesters in Britain demand climate action. Photo: Garry Knight (creative commons).](image)

**FIG. 16: POTENTIAL GHG REDUCTIONS THROUGH GLOBAL DIETARY CHANGE**

- **GHG EMISSIONS SAVINGS IN 2050 (GTCO₂EQ)**
- **GHG SAVINGS AS % OF 2012 GLOBAL EMISSIONS**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>GHG Emissions Savings in 2050 (GTCO₂EQ)</th>
<th>GHG Savings as % of 2012 Global Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption of Healthy Diet</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>75% Cut in Meat Consumption</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>50% Cut in Food Waste</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Healthy Low-Meat Diet + 50% Food Waste Cut + AG Yield Gains</td>
<td>30%</td>
<td>30%</td>
</tr>
</tbody>
</table>
“Left unchecked, current dietary patterns are incompatible with a two-degree pathway. If we are to avoid dangerous climate change, global yearly emissions must fall rapidly from today’s levels of 49 GtCO₂e to around 23 GtCO₂e by 2050. If meat and dairy consumption continues to rise at current rates, the agricultural sector alone will soak up 20 of the 23 GtCO₂e yearly limit in 2050, leaving just 3 GtCO₂e for the rest of the global economy.”112

“Emissions...must be kept at or below [21 GtCO₂eq] per year by 2050... Under the business-as-usual scenario... the emissions from agriculture alone would nearly reach this emissions threshold in 2050.”111

“Global adoption of a healthy diet would see a yearly emissions saving of 6 GtCO₂e in 2050, almost all of which would result from reduced consumption of meat and dairy produce.”112

“A global reduction in meat and dairy intake by 75% by 2050 could reduce emissions by 7.4 GtCO₂e, an amount greater than the emissions from the entire transportation sector in 2010... Smaller reductions in meat intake will likely not be enough to avoid 2°C.”111

“Halving global wasted food could reduce emissions by an estimated 4.5 GtCO₂e. This is greater than reductions associated with technological interventions such as increasing agricultural yields and technical mitigation.”111

“Keeping global warming below 2°C will more than likely require reduction in both meat and dairy intake and wasted food, combined with rapid and dramatic reductions across non-agricultural sectors. The combined effect of adopting a healthy, low-meat diet, reducing wasted food by 50% and increasing agricultural yields could reduce agriculture related emissions by 14.3 GtCO₂eq by 2050.”111

“WORLDWIDE ADOPTION OF A HEALTHY DIET WOULD GENERATE OVER A QUARTER OF THE EMISSION REDUCTIONS NEEDED BY 2050.”

—CHATHAM HOUSE, “CHANGING CLIMATE, CHANGING DIETS,” 2015

Image Above: World leaders, including General Secretary of the United Nations Ban Ki Moon, celebrate the signing of the Paris Climate Agreement in December 2015. The agreement states that nations will set the goal of keeping global warming “well-below two degrees Celsius.” Photo: Alamy.
In addition to making recommendations for mitigating climate change through diet, both Johns Hopkins and Chatham House have recommended key steps to catalyzing the necessary change. Both institutions suggest actions by governments and NGOs to influence the public. Chatham House notes that “government inaction signals to publics that the issue is unimportant or undeserving of concern.” While Johns Hopkins suggests “leveraging behavior change campaigns aimed at reducing demand for livestock production.”

5 To Do Today has partnered with the Chinese Nutrition Society to help promote its latest recommended dietary guidelines, released in May 2016. The guidelines are created in partnership with China’s Ministry of Health and are released every 10 years. The latest recommendations include a reduction in meat consumption of over 50% compared to current levels and over 70% compared to projected consumption in 2030. CNS recommends consuming between 40 and 75 grams per day of meat or between 14.6 and 27.4 kg per year.

5 To Do Today has produced posters and billboards featuring celebrity ambassadors to disseminate key nutrition messages to all provinces and autonomous regions of China.
POTENTIAL FOR EMISSIONS REDUCTIONS

Without intervention, GHG emissions from Chinese meat consumption would rise by over 50% to total over 1.8 GtCO₂eq in 2030, greater than the current emissions of all but four countries (China, US, India and Russia). To establish the potential for GHG emissions reductions through adoption of the CNS recommended levels of meat consumption, To Do Today examined the following two scenarios:

2015:

In 2015, the nationwide adoption of the CNS recommended levels of meat consumption could have lowered emissions from Chinese meat consumption by 675 MtCO₂eq, or 56%. Equivalent to:

- Reducing emissions from agriculture in China by 81%
- Reducing global agriculture emissions by over 12%
- Reducing total Chinese emissions by over 6%
- Reducing total global emissions by over 1.5%

2030:

By 2030, CNS guidelines could achieve reductions in emissions from Chinese meat consumption of 1.27 GtCO₂eq, or 70.8% lower than projections. Equivalent to:

- Reducing global agriculture emissions by over 22%
- Reducing total Chinese emissions by over 9.5%
- Switching to the CNS recommended levels of meat consumption could account for 8.5% of the global reductions necessary to stay on the pathway to two degrees, which requires emissions are lowered to approximately 35 GtCO₂eq annually by 2030.

For full analysis see page 26.

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CNS DIETARY GUIDELINES 2016

<table>
<thead>
<tr>
<th></th>
<th>DAILY RECOMMENDATION (G)</th>
<th>ANNUAL RECOMMENDATION (KG)</th>
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<tr>
<td>GRAIN</td>
<td>250–400</td>
<td>91.25–146</td>
</tr>
<tr>
<td>VEGETABLES</td>
<td>300–500</td>
<td>109.5–182.5</td>
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<tr>
<td>FRUIT</td>
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</tr>
<tr>
<td>SEAFOOD</td>
<td>40–75</td>
<td>14.6–27.4</td>
</tr>
<tr>
<td>MEAT</td>
<td>40–75</td>
<td>14.6–27.4</td>
</tr>
<tr>
<td>EGGS</td>
<td>40–50</td>
<td>14.6–18.3</td>
</tr>
<tr>
<td>DAIRY</td>
<td>300</td>
<td>109.5</td>
</tr>
<tr>
<td>BEANS</td>
<td>25–35</td>
<td>9.1–12.8</td>
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<tr>
<td>OIL</td>
<td>20–30</td>
<td>7.3–11</td>
</tr>
<tr>
<td>SALT</td>
<td>0–5</td>
<td>0–1.8</td>
</tr>
</tbody>
</table>

---

FIG. 17: GHGS FROM MEAT CONSUMPTION IN CHINA (MTCO₂EQ)
CONSUMER RECOMMENDATIONS

EAT LESS MEAT

While choosing vegan or vegetarian diets will do the most to reduce GHG emissions, every bit counts. If cutting out meat completely is not possible, choosing a diet based on the Harvard Healthy Eating Plate will reduce GHG contributions from food to the same level as a vegetarian diet while still allowing for limited meat consumption. The Livewell Plate would also significantly reduce GHG emission from food and is one of the only diets that takes GHG into its calculations. Even eating one or two more meatless meals per week can help improve health and reduce environmental impacts.

EAT LESS BEEF AND LAMB

Rumination contributes 40% of global livestock emissions and with a thirst for water over 20 times that of tofu, beef and lamb are by far the least efficient and most damaging sources of protein.

REDUCE FOOD WASTE

Cutting portion size and cleaning your plate whether at a restaurant or at home is the easiest way to reduce GHG emissions from food. Savings vary from 20 to 50% depending on the country of residence and personal habits.

MEATLESS MONDAY

Meatless Monday is a global movement to promote adopting a vegetarian diet one day each week for health and environmental reasons. Participating in Meatless Monday not only reduces emissions, it also shows solidarity with a movement for better, healthier and more climate friendly food choices. By familiarizing participants with delicious plant-based recipes, Meatless Monday also encourages better eating during the rest of the week.

EAT LOCAL

Local food has, on average, 5 to 17 times less GHG emissions than conventionally produced food. Though the exact savings depend heavily on the on-farm inputs and transportation involved, local food will cut out all flown food, which has a footprint much larger than food that has been trucked, trained or shipped.

KNOW YOUR DIET

Diets that promote health, weight loss, environmentalism, animal rights or any other single perspective are unlikely to consider GHG emissions or sustainability. Paleo or Atkins diets may help people lose weight, but all that meat is unsustainable. Eating free-range and grass fed beef may be better for the quality of cattle life, but also contributes more emissions than its factory-farmed counterpart. Pescetarianism is seen as an alternative to the cruelty of factory farms, but those who choose this diet will find it hard to calculate their environmental impact and could in fact be increasing GHG emissions while depleting worldwide fisheries.
There will be no mitigating climate change without the commitment of the Chinese government and the cooperation of its 1.4 billion people. There are three reasons for this:

- China is the world’s largest emitter of greenhouse gas and has yet to hit an overall emissions peak. As with the United States, the second largest emitter, reducing GHG emissions is impossible globally without China reducing them locally.

- As the country continues to develop, hundreds of millions of people are set to join the ranks of the urban middle class in China. How and what these individuals consume will have far-reaching impacts on the planet.

- China’s rapid economic development is considered by many developing countries as a model for bringing their own population out of poverty. If China can show that economic development can coincide with decarbonization, other countries will follow. If China cannot define a path to low-carbon development for low and middle income countries, other nations are more likely to follow the fossil fuel-driven and export-led model that China has followed thus far, which could require further increases in GHG emissions.

Given its centralized political system, China has the opportunity to implement emissions-reduction programs with unmatched speed and scale. This can be seen in its transition away from coal and toward renewable energy sources and in its record sales of new energy vehicles. It can also be seen in its government directives. In 2014, the State Council:

*Citizens shall enhance environmental protection awareness and adopt a low-carbon and energy-saving lifestyle, and conscientiously fulfill the obligation of environmental protection.*

It is unsurprising then, that the Chinese Nutrition Society is leading the world in advocating for significantly reduced meat consumption. By 2030, China is projected to add the equivalent of the entire US consumption to global demand for meat and dairy, which will increase related emissions by over 50%. However, if citizens follow the CNS guidelines and reduce consumption to recommended levels, emissions from meat consumption would be 56% less than in 2015 and 70% less than projected in 2030.

While driving down emissions, adoption of CNS recommendations would help ensure food security in the face of threats such as water shortages, pollution and desertification. With 1.4 billion people, China has 25% of the arable land of the US and 33% the global average per capita water resources. China is likely to feel the effects of climate change on food security first, fastest and on the largest scale. Reducing meat consumption is a clear way to get ahead of these and other potential resource crises.

If China is able to make progress on the issue of meat consumption and the issue of GHG emissions, it could ignite global competition and ultimately inspire others to follow suit. Lowering emissions through competition benefits us all from a sustainability perspective, while leading on the issue also benefits China from a geopolitical one. As a 2015 Chatham House report suggests, “decisive action in the West may galvanize belief in China that change is possible and worthwhile, and vise versa.”

Professor Yuexin Yang, President of the Chinese Nutrition Society, announces her organization’s new dietary recommendations at a press conference on May 15, 2016.
ENDNOTES


3. Avata Alliance Foundation “Fact Sheet: The Environmental Impact of Animal-Based Foods.”


5. Ibid.


16. AAF, “Fact Sheet.”


18. McSweeney, Robert “Global temperature rise set to hit 1℃ of warming this year, Met Office says.” Carbon Brief, 9 Nov. 2015.


21. 49 GtCO2eq (estimated annual emissions) X 1.45 = 7.105 GtCO2eq.


23. AAF, “Fact Sheet.”


25. CEA, 2013.

26. United Nations, FAOStat database

27. CEA, 2013.


30. Chinese Nutrition Society


32. CEA, 2013.

33. Ibid. See notes 7 and 8.

34. CEA, 2013.

35. Ibid.

36. Ibid.


39. AAF, “Fact Sheet.”

40. Ibid.


44. Ibid.


50. UNCCD “Climate change and land degradation: Bridging knowledge and stakeholders.” 9-12 March 2013.

51. Ibid.


53. UNCCD


57. Bailey, et. al. 2014


64. Ibid.


69. National Bureau of Statistics, China


71. WWF “Solving the Soy Problem.” http://wwf.panda.org/what_we_do/footprint/agriculture/soy/


76. Shefali, 2014.

77. Ibid.

78. Ibid.

79. Ibid.


A soybean harvest is underway. Compared to livestock products, soy protein requires less land and water to grow and emits less greenhouse gas. Photo: A Pixabay
APPENDIX

CNS GUIDELINE ANALYSIS IN DETAIL

POPULATION:
The National Bureau of Statistics provided the 2015 population while China Daily reports on official population projections for 2030.16

MEAT CONSUMPTION:
Per capita meat consumption in 2015, was provided by the Chinese Nutrition Society. For projections of meat consumption in 2030, the California Environmental Associates (CEA) report “Dietary Trends in Asia” was used. However, the projection for lamb was not provided in the CEA projections and was estimated by the Chinese Nutrition Society for 2030.

GHGS PER KILO OF MEAT:
In its report Changing Climate, Changing Diet, Chatham House aggregated several assessments on the total emissions per kilo of meat. However, this analysis does not take into account potential reductions in emissions intensity through technological mitigation. Technological mitigation combined with the stated reductions in meat consumption could have even greater potential for overall emissions reductions by 2030 than stated in this analysis. A recent study estimates that better feed and grazing practices could reduce total emissions from livestock by 2 GtCO₂eq globally, mainly from developing countries such as China.17

TOTAL GHG EMISSIONS:
Total emissions for the world and China are from the CAIT database provided by the World Resources Institute. As 2015 emissions data was not yet available, the most recent data (2012) was used for the 2015 scenario.

EMISSIONS FROM AGRICULTURE:
Agriculture emissions for 2015 and projections for 2030 in China are from the FAOStat database. Unfortunately, as 2015 data was not yet available, and the most recent data (2012) was used for the 2015 scenario. The emissions data from agriculture is not a perfect comparison to emissions from meat consumption, but provides a useful benchmark. For one, FAOStat emissions calculate GHGs from the country of agricultural production, not the country of consumption. Because of the large imports of soy and corn to feed its livestock, much of the emissions associated with Chinese consumption are attributed to the country of production. Secondly, agricultural emissions encompass all agriculture, not only those limited to livestock, meat and dairy.

CNS DIETARY GUIDELINES:
The levels of meat consumption used in these calculations are from the high-end of the range recommended by CNS, approximately 27.34 kg per year. As CNS does not specify the type of meat, the proportion of meat types in these calculations is found by using the breakdown of meat proportions for current consumption for the 2015 scenario, and from the CEA projections for the 2030 scenario, then applying those proportions to the total recommended consumption of 27.34 kg.

OTHER NOTES:
This analysis is limited to emissions from meat consumption only and does not include emissions from substitute protein sources such as soy, seafood or dairy.

GHGS FROM MEAT CONSUMPTION IN CHINA

<table>
<thead>
<tr>
<th>GHG PER KILO</th>
<th>ANNUAL CONSUMPTION PER CAPITA 2015 (KG)</th>
<th>ANNUAL GHG PER CAPITA (KGCO₂E EQ)</th>
<th>NATIONAL GHG TOTAL 2015 (MTCO₂E Q)</th>
<th>ANNUAL CONSUMPTION PER CAPITA 2030 (KG, CEA PROJECTION)</th>
<th>GHG PER CAPITA, 2030 (KGCO₂E EQ, PROJECTED)</th>
<th>NATIONAL GHG TOTAL 2030 (MTCO₂E Q, PROJECTED)</th>
<th>INCREASE IN GHG, 2015–2030 (MTCO₂E Q)</th>
<th>% INCREASE IN GHG, 2015–2030</th>
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</thead>
<tbody>
<tr>
<td>Poultry</td>
<td>7.00</td>
<td>13.34</td>
<td>93.38</td>
<td>128.36</td>
<td>24.00</td>
<td>168.00</td>
<td>243.60</td>
<td>115.24</td>
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<td>Pork</td>
<td>8.80</td>
<td>40.97</td>
<td>360.54</td>
<td>495.60</td>
<td>38.00</td>
<td>510.40</td>
<td>740.08</td>
<td>244.48</td>
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<tr>
<td>Beef</td>
<td>56.60</td>
<td>5.44</td>
<td>307.90</td>
<td>423.25</td>
<td>8.00</td>
<td>452.80</td>
<td>656.56</td>
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<td>Lamb</td>
<td>31.30</td>
<td>3.36</td>
<td>105.17</td>
<td>144.57</td>
<td>3.62</td>
<td>113.31</td>
<td>164.29</td>
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<td>63.11</td>
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<td>1191.78</td>
<td>93.62</td>
<td>1244.51</td>
<td>1804.53</td>
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### GHG FROM CNS RECOMMENDATIONS 2015

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<th></th>
<th>Annual Consumption Per Capita 2015 (kg)</th>
<th>Annual Consumption Per Capita (kg), CNS Recommendation</th>
<th>GHG Emissions Per Kilo (kgCO₂ EQ)</th>
<th>Annual GHG Per Capita (kgCO₂ EQ)</th>
<th>National GHG Total From CNS Diet (MTCO₂ EQ), 2015</th>
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<tbody>
<tr>
<td>Poultry</td>
<td>13.34</td>
<td>5.78</td>
<td>7.00</td>
<td>40.47</td>
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<td>Pork</td>
<td>40.97</td>
<td>17.76</td>
<td>8.80</td>
<td>156.25</td>
<td>214.78</td>
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<tr>
<td>Beef</td>
<td>5.44</td>
<td>2.36</td>
<td>56.60</td>
<td>133.44</td>
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<td>1.46</td>
<td>31.30</td>
<td>45.58</td>
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</tr>
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<td><strong>Total</strong></td>
<td><strong>63.11</strong></td>
<td><strong>27.35</strong></td>
<td><strong>313.30</strong></td>
<td><strong>375.73</strong></td>
<td><strong>516.48</strong></td>
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### GHG FROM CNS RECOMMENDATIONS 2030

<table>
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<th></th>
<th>CEA 2030 Diet (kg, Projected)</th>
<th>Annual Consumption Per Capita (kg), CNS Recommendation</th>
<th>GHG Emissions Per Kilo (kgCO₂ EQ)</th>
<th>Annual GHG Per Capita (kgCO₂ EQ)</th>
<th>National GHG Total From CNS Diet (MTCO₂ EQ), 2030</th>
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<td>7.01</td>
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<td><strong>Total</strong></td>
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<td><strong>363.44</strong></td>
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### GHG REDUCTIONS FROM CNS RECOMMENDATIONS IN CHINA

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<th>Projected GHGs in 2030 (MTCO₂ EQ)</th>
<th>GHGs From CNS Recommendations, 2015 (MTCO₂ EQ)</th>
<th>GHGs From CNS Recommendations, 2030 (MTCO₂ EQ)</th>
<th>CNS % Reduction, 2015</th>
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<tr>
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<td>Pork</td>
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<td><strong>Total</strong></td>
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<td><strong>516.48</strong></td>
<td><strong>526.98</strong></td>
<td><strong>56.66%</strong></td>
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### TOTAL GHG REDUCTIONS FROM CNS RECOMMENDATIONS

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<th>2015 (MTCO₂EQ)</th>
<th>2030 (MTCO₂EQ, Projected)</th>
<th>CNS Reduction in 2015 As % Of:</th>
<th>CNS Reduction in 2030 As % Of:</th>
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<tbody>
<tr>
<td>World Total GHG Emissions</td>
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<td>China Total GHG Emissions</td>
<td>10975.5</td>
<td>6.13%</td>
<td>9.67%</td>
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### AGRICULTURE GHG REDUCTIONS FROM CNS RECOMMENDATIONS

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<th>2015 (MTCO₂EQ)</th>
<th>2030 (MTCO₂EQ, Projected)</th>
<th>CNS Reduction in 2015 As % Of:</th>
<th>CNS Reduction in 2030 As % Of:</th>
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</thead>
<tbody>
<tr>
<td>World Total GHG From Agriculture</td>
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<td>12.55%</td>
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<tr>
<td>China Total GHG From Agriculture</td>
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