

Urban Food Consumption in Metro Manila

Interdisciplinary Approaches Towards Apprehending Practices, Patterns, and Impacts

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Summary

Food consumption is a local activity related to environmental impacts at different scales. Yet, the link between eating food as a social and cultural practice and the global implications of food consumption has not been sufficiently explored. We adopt a multidisciplinary approach to relate social practices with the biophysical flows of food products at the household level. Focusing on middle-class households in Metro Manila, the Philippines, we conduct qualitative interviews to highlight preferences, habits, and perceptions about food consumption. In parallel, we collect quantitative information on food purchased. We relate our results to national trends by analyzing the recent evolution of national food expenditures. Finally, we review environmental impacts related to main food categories. Our research points to the significance of socioeconomic factors on food consumption, notably the presence of domestic help or the professional situation of household members. One main finding is the identification of eating out as an important and growing trend in Asian cities, which causes a shift of resource consumption and related environmental impacts from the household to the service sector.

Introduction

What we eat is part of complex systems, involving food production, processing, transport and storage, as well as preparation, consumption, and food waste disposal. Eating food is a local activity, but relates to both local and global food chains, involving resource inputs at different stages and outputs with impacts at different scales, from local pollutants to greenhouse gases (GHGs) (EEA 2012). In Europe, food is one of the most relevant areas in household consumption, contributing to 20% to 30% of different environmental impact categories (Tukker et al. 2006). Households can play a role in rendering food consumption more efficient, yet limited research exists relating everyday consumption practices, to biophysical patterns of consumption and related impacts.

Food consumption trends worldwide have significantly changed in the last decades. The consumption of animal products has tripled in developing countries since 1963 (Kearney 2010), and the rise in consumption of processed and ultraprocesed products has been noted in several countries, not least in relation to health concerns (Kearney 2010; Monteiro et al. 2010a; FAO 2004). These trends are all the more relevant in the context of developing countries where shifts in diet among the middle classes entail massive changes in land and energy requirements for food provisioning, with related environmental impacts (Duchin 2005; Myers and Kent 2004). Understanding the consumption patterns of middle-class consumption today could be a powerful predictor of future trends. Middle classes in emerging economies are generally perceived as “resource

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predators,” with empirical evidence lacking to substantiate this claim (Lange and Meier 2009).

Although there is no single definition for what constitutes the middle class, Asia is seen as the epicentre for the “new consumer” phenomenon (Myers and Kent 2004). For this article, we consider food consumption as a social practice that is embedded in culturally grounded social systems. To understand *how and in what way* people consume, we consider food as part of everyday life and related activities, drawing from social practice theories. To understand *how much of what* people consume, we draw from industrial ecology (IE) approaches that consider food consumption as a biophysical activity with related environmental impacts. Combining these two approaches can be problematic, as we will discuss in this article, yet represents a relevant and novel interdisciplinary approach to consumption studies.

National consumer expenditure surveys and income and expenditure surveys provide some insights into patterns of consumption, yet such data often fail to reflect income group diversity at the city level. Micro-level research at the level of households can provide a finer reading of consumption, yet gathering such data can be resource intensive and may not result in representative findings. Our approach in this article is to consider three scales of analysis in relation to the food consumption patterns and practices of the middle class in Metro Manila, the Philippines, a growing megacity in Southeast Asia. At the household level, we used memory recall methods and in-depth qualitative interviews among 30 households, in order to understand how food consumption practices and patterns inter-relate. We then consider national statistics for the Philippines, to further explore trends in food consumption patterns. Finally, we discuss our findings with respect to life cycle environmental impacts (LCEIs) that are relevant at the global scale. Our goal is to bring together these different levels of analysis and introduce an interdisciplinary approach to understanding urban food consumption practices, patterns, and impacts, from the household to the national and global level.

Conceptual framework

Two complementary frameworks for studying consumption are brought together: consumption patterns as a biophysical activity and consumption as part of daily life and associated practices. As a biophysical activity, consumption involves material and energetic provisioning from resources that draw from, and depend on, ecosystem services and natural processes—thus submitting this form of economic activity to the constraints of the biosphere (Georgescu-Roegen 1966, 1971, 2006). For Ayres and Simonis (1994), assessing the industrial metabolism of a biophysical activity means evaluating the quality and quantity of energy and matter stocks and flows in a given system, and understanding how that system could be designed to perform with less environmental impacts throughout the entire process—from the extraction of natural resources, through production, consumption, and final disposal.

Although more attention had been placed on production systems in the past, the IE community has taken up the

question of consumption in recent years (Hertwich 2005; Tukker et al. 2010). The activities of households can be assessed through material flow analysis and input-output accounting, for example, with the impacts of products and services assessed with life cycle assessment (LCA) methodology (Jungbluth et al. 2011; Jungbluth 2000; Jungbluth et al. 2000; Moll et al. 2005; Mogensen et al. 2009). However, how much materials and energy a household consumes in preparing and eating a meal reveals little about why and in what way those consumption patterns persist or change. For this, interdisciplinary research is necessary that combines a biophysical understanding of consumption, with the view of consumption as tied up with everyday social life in specific contexts.

Wilk (2002) proposes three main research strands for understanding consumption as part of everyday life: consumption as social, cultural, or driven by individual choice approaches. By far, the most dominant approach in research and policy making has been the view of consumption as being motivated by individual decision-making processes. Recently, there has been a shift of attention from social psychology and behavioral psychology approaches (Stern et al. 1997; Stern 1992) to a social practice theory approach to consumption, which takes the analytical focus away from atomized individuals and technologies, to a vision of consumption as part of everyday collective routines and habits. The contours of this theoretical framework are varied, with researchers proposing differing perspectives on what constitutes a practice (Reckwitz 2002; Røpke 2009; Shove 2003; Spaargaren 2011; Warde 2005). In one definition, practices are seen as being made up of competences, images, and equipment (Shove and Pantzar 2005). Food consumption as a practice has been the object of much research (e.g., Warde 2013, 2014; Sahakian and Wilhite 2014; Plessz et al. 2014; Bourdieu 1979).

Combining social theories with IE approaches is relatively recent in the literature, with some work drawing from social practice theory to further understand energy consumption patterns (Sahakian 2014; Gram-Hanssen 2009). On food consumption specifically, Sonesson and colleagues (2005) reveal the complex interactions between mobility practices, shopping frequency, and food wastage; and Green and Foster (2005) investigate the effect of social structures in influencing innovations in the UK frozen pea sector. In terms of arguments for more links between social theories and IE, several researchers (Schiller 2009; Lifset 2008; Hoffman 2003) call for considering different disciplinary approaches in assessing biophysical processes, including the policy dimension, social systems analysis, and ecological economics. Combining social practices theory with approaches from IE is one of the innovative aspects of this article.

Methodology and Research Site

Methodology

Households (HHs) are typically defined as groups of people living together and taking food from a common kitchen (NSSO 2013). The system’s boundaries for the quantitative assessment are set as the physical space delimited by the outer walls of

the household. Between July and November 2013, in-depth interviews were conducted among 30 households in Metro Manila. Our aim was not to gain a homogenous sample within the middle class, but rather select households representing the diversity and heterogeneity of a wide income group, using theoretical sampling techniques (Strauss and Corbin 1998) and considering income range, housing composition, and educational levels, among other factors. Whereas the small sample size is not intended to be representative, many of our research results match national trends, such as the increase in expenditures for eating out among the middle class. Our sample did allow us to compare and contrast different household consumption patterns, which enabled us to fully exploit the dialectic between qualitative and quantitative approaches. In this process, our interest was in uncovering the outliers, in terms of consumption patterns, in order to demonstrate that unusual quantitative research findings could be explained through complementary, qualitative research.

Within our sample, the household size varies from one to nine members, with households belonging to the lower (43%), average (23%), and upper (30%) middle-class income brackets.¹ Exposure to foreign countries is high among our sample: 57% of the households report that at least one member lived abroad in the past. This is not surprising, given that the Philippine government actively encourages circular migration as part of their Overseas Filipino Worker (OFW) program, with OFW remittances contributing close to 10% of gross domestic product (GDP) in 2013 (World Bank 2014). There is a predominance of the 20- to 40-year age category among the respondents (77%), whereas 15% of the respondents are 50+ years old. In terms of gender, 60% of the respondents are women.

During the household visits, in-depth semistructured interviews engaged household members in a discussion around household food consumption practices and how they may have changed over time. Respondents also answered survey questions designed to capture food consumption patterns, using as a proxy the food purchased that entered the household, described in terms of quantity and frequency. We do not consider what is ingested by household members, given away, or used for another purpose, once it enters the household. Food consumption outside of the home is also not included in the quantitative assessment, rather discussed in qualitative interviews. For gathering quantitative information, we used memory recall, a methodology that is common in expenditure surveys (NSS 2012; Smith and Subandoro 2007). Unlike food diaries, which capture food intake amounts, this method captures food and beverage mass as they are purchased, including the nonedible fractions (peels, bones, and so on) and components that may eventually be wasted. The general format for questions related to food consumption patterns is: "How many [units, e.g. kg] of [product, e.g. rice] is purchased in a week?" We distinguish between processed and nonprocessed foods. Products categorized as *processed* correspond to the category *ultraprocessed food* defined by Monteiro and colleagues (2010b), including ready-made breads, biscuits, sweets, cheese, and canned products. Quantities are computed in kilograms (kg; for beverages,

volumes are converted assuming an average density of 1 kg per liter [L]), brought to weekly values and expressed relative to the number of household members. When respondents were unsure about size and weight, the research team compared estimates to a chart designed to list the features of common food products available in Metro Manila. As is always the case with memory recall methods, questions on the validity of responses remain and will be addressed in our conclusion. We assumed that all respondents understood the questions similarly. Household waste quantities and types are not considered in this article and are the subject of further research (Leray et al. 2015).

In order to relate our micro-level household data to national trends, we consider food consumption expenditures among the middle classes by drawing from the Family Income and Expenditure Survey (FIES), which collects detailed income and expenditure data every 3 years in the Philippines based on memory recall methods. We use food expenditure data pertaining to the years 2003 and 2009, which are adjusted for inflation for this analysis. Conducted biannually, the survey includes a first interview in July to gather data for the first half of the year, followed by a second interview in January, to account for the last half of the year. The concept of "average week" consumption is used for all food items. Though the FIES sample is designed to be representative of diverse consumption patterns and economic classes, the limits of this survey relate to memory recall methods and timing, given that the survey is not spread across the year, but executed at two periods. Despite these limitations, the data do allow us to show some broad, national consumption trends. In order to assess the environmental significance of certain micro and macro trends in food consumption, we draw from a literature review of LCA studies worldwide. We stop short of undertaking a complete LCA for food products in Metro Manila because of the lack of available background life cycle inventory data.

Research Site: Metro Manila

An archipelago in Southeast Asia, the Philippines has a population of 97.71 million and land area of 300,000 square kilometers. The middle class comprised around 20.1% of the overall population in 2003 and have marginally increased to 21% in 2009. Average middle-class annual earnings reached US\$8,350 in 2003 and increased to US\$9,400 in 2009 in real terms. However, the average expenditure on food as a proportion to total income has remained more or less constant at 27% over the past decade in real terms. Labor force participation rates (LFPRs) for females are around 49.8% and for males 79.8%. The high female LFPRs in Philippines is exceptional in the context of a developing country, with rates comparable to those of more advanced economies. Working abroad is a common livelihood strategy, with an estimated 2.22 million overseas Filipino workers in 2013, of which 48.3% were females (PSA 2013).

The Philippines is one of the world's largest livestock producers (World Bank 2012). Local production is dominated in volume by pork and chicken; in 2013, approximately 20% of both beef and water-buffalo meat was imported, up from 8.5% and zero, respectively, in 1990 (CountryStat Philippines 2015).

The country has converted 40.6% of its land area into agricultural land (World Bank 2011a), contributing to significant environmental impacts related to the use of chemical fertilizers and GHG emissions. Rice is a major cereal crop produced in the Philippines, with 4.7 million hectares (ha) of its land being used for its cultivation; cereals, oil crops, coconuts, maize, sugar cane, fruits such as pineapples, bananas, and mangoes, and aquaculture make up the remaining main cultivation (FAO 2013a). The Philippines was the world's largest importer of rice in 2010 (Reuters 2011) whereas its own production accounts for 2.3% of global rice production (FAO 2013b). In comparison, China and India are the biggest rice producers, achieving around 28% and 21%, respectively, of global rice production (FAO 2013b).

The focus of this article is on the middle classes in Metro Manila, the national capital region of the Philippines. With an estimated population of 11.7 million, Metro Manila is a site of "new consumer" consumption, with shopping centers becoming important leisure destinations for food purchasing and for eating out. What and how people eat in Metro Manila is constantly evolving, not least in relation to historical trajectories involving colonial and postcolonial influences, but also in relation to the ongoing effects of globalization and neoliberalism.

Empirical Analysis: Food Consumption Patterns and Practices

Results of the Micro-Level Analysis: Studying Household Food Consumption

There is no standard food consumption pattern among the middle-class households that participated in our research: *how much* of *what* food people purchase and *why* depends on a number of factors, not least related to household composition, the presence of domestic help, and working patterns. The weekly, per capita household purchase of food in weight is presented in figure 1. An outlier stands out (HH30) and is described in Box 1.

BOX 1: Household Number 30

This young man lives with his working mother and attends a local university. Both eat their breakfast at home and usually eat out for lunch during the week, with the son mostly frequenting fast food shops, for the price, taste, and convenience. On weekends, his mother purchases and cooks "huge amounts of food," as he puts it. She tends to buy produce in bulk, then prepare food for the extended family that visits their home, but also for other families living in their compound. She likes to prepare sufficient food so as to have leftovers available throughout the week. Though there are only two members in their household, cooking for neighbors and extended family may explain the high amount of food purchased per week, 20 kg per person. Whether she gives food away for charity or monetary return remains unclear. She also claims to buy meat in bulk, when on sale in the supermarkets, to then store in the freezer—which could also explain the high amount of meat purchased in a given week.

Eating Out and Ordering In

Several respondents eat at least one meal outside of the home on a daily basis, primarily in the context of office work. Meals are eaten mostly in workplace canteens, with respondents citing convenience and cost as the main motivator behind this practice. Families tend to eat more meals at home, as opposed to single-member households who tend to eat out—as in the example of HH02 (Box 2). In some cases, meals are prepared at home, then carried to the workplace in what is known as *baon*, in Tagalog, or a packed lunch. One family describes eating breakfast in their workplace canteen in the mornings before bringing their young son to preschool; they will pack a *baon* directly from the canteen, for their son, including rice and a banana, for example. Several respondents also describe eating outside in restaurants on weekends, enjoying a variety of different types of foods available in Metro Manila, such as Italian, Japanese, Chinese, or Thai food. Only one respondent among the 30 interviewed reported eating outside less than once per week: She often eats at her mother's home, but does not associate this with "eating out."

BOX 2: Household Number 2 and Household Number 9

Household Number 2

This 22-year-old working woman lives with flatmates. She eats most of her meals at the office during the week and explained: "I usually skip my lunch, so I'll eat breakfast and heavy snacks," such as sandwiches and fruits. On the weekends, the flatmates enjoy eating out and consuming snacks at home, when watching TV series. These snacks include chips and dips, fried seaweed, or ice cream. At home for dinner, the young woman might sometimes cook rice and meat (primarily chicken and pork, and sometimes fish), but mostly eats out. Processed meats, such as hot dogs, are also cooked at home, using a variety of sauces, such as tomato sauce, chilli sauce, oyster sauce, or gravy mix. When asked what has changed the most since her childhood, she says she is eating more meals outside of the home. Their flat is located next to several fast food restaurants, which results in her also eating more fast food since moving to this area.

Household Number 9

This 50-year-old unmarried woman lives in a boarding house near the university campus, where she works. On weekdays, she eats most of her meals at the school cafeterias. Over her lifetime, she has lived between Metro Manila and her birthplace of Davao, including a few months in Sydney, for her studies then again to apply for permanent residency, as well as a few months in Chicago, where she has family. In the morning and on weekdays, she will have orange juice and yogurt at home, which is not a common breakfast in the Philippines. She learned this when living in Australia and feels that it contributes to a healthy diet. Every 2 weeks, she goes to Cavite (southwest of Manila) to visit family and brings food back, including different prepared dishes. When she visits Davao, she will also bring back *bisayang manok*, a type of chicken that is not available in northern Philippines. When asked what she has at home, she replies "all we have there are biscuits."

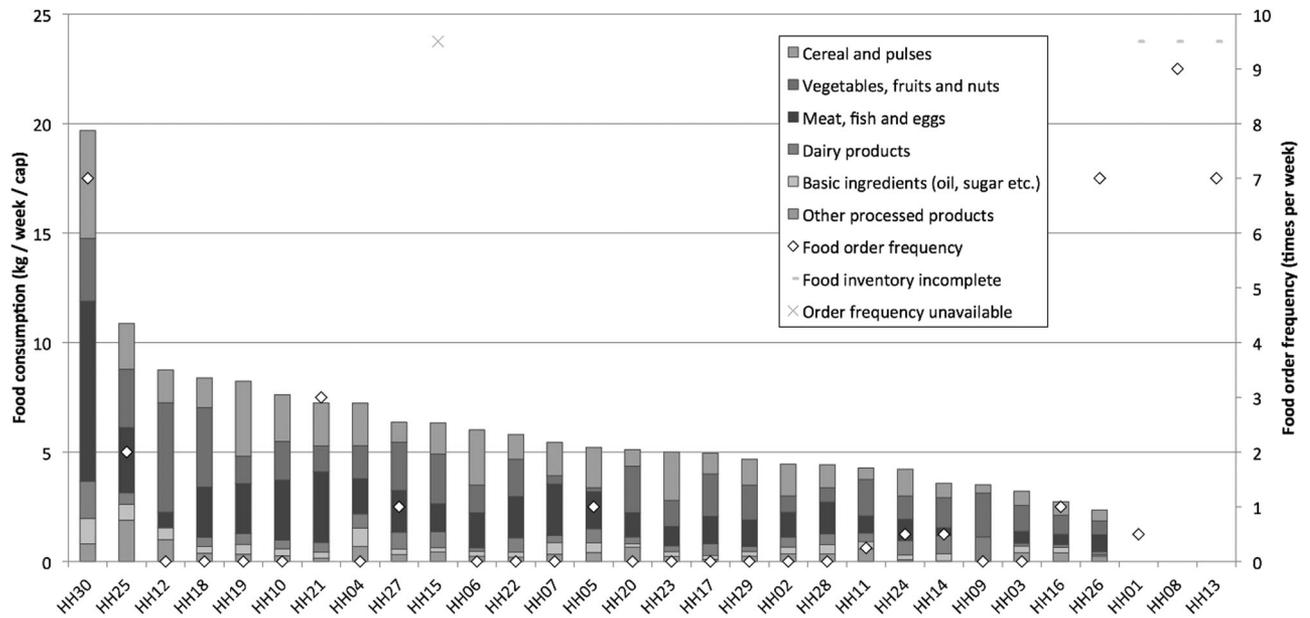


Figure 1 Household food purchases, among the Metro Manila sample. *Other processed products* include biscuits, sauces, and so on, and excludes processed food included in other categories. These figures exclude the ready-made food ordered at home and food consumed outside the household. As an indication, the reported frequency of food order in the household is also shown.

Ordering prepared food at home was a common practice in our sample, though because of practical constraints, the quantity of food ordered or received at home could not be assessed. Approximately 40% of the households report ordering food from outside. Most of them order relatively rarely (once a week or less). However, a respondent in a household composed of three flatmates below 35 years old reports ordering food once a day on the weekdays, and two to three times during the weekend, mostly at fast food restaurants. Several households reported ordering food eight times per week. For two students in their twenties who live together in a shared flat, ordering is a matter of convenience, but also more cost-effective. They often order in quantities that allow them to have leftovers for the next day. Though they recognize that cooking at home might be better for their health, they turn to prepared food for convenience because they both work and have no domestic help. Household members tend to eat outside or order food less frequently when domestic helpers are present. For instance, one respondent mentioned that she stopped ordering food from outside once she employed a domestic helper.

Meat and Dairy Products

No household reports a vegetarian diet. Some households consume a wide range of meat categories, especially chicken, pork, and beef/buffalo. Others display clear preferences for certain types of meat (figure 2). For instance, several households do not consume pork; in contrast, pork makes up for around 70% of the meat consumption in HH17. One reason for this is that the woman cooking for this household tends to shop at a supermarket, which is conveniently located on her way home from work and where ground pork is readily available. Though

she would like to cook more fish, she finds that cooking ground pork is easier than preparing fish, particularly because she has a young child who likes pork dishes. When she eats out, however, she tends to order fish dishes. Religion is not an explanation for some households not consuming pork, given that most of the households are Christian. These preferences for different meats seem to relate to personal taste, developed over the course of a lifetime. Only HH18 reports purchasing mutton/lamb, because this type of meat is typically imported into the Philippines and can be costly, compared to pork.

In HH09, the respondent indicated that though she eats meat, none is purchased at home. If we were to consider only the survey on food purchases, we would mistakenly conclude that this person has a vegetarian diet. In fact, most of her meals occur outside the home, as described in Box 2. For her, living abroad has changed her consumption patterns, showing the influence of mobility on local consumption. Travel within the Philippines is also a way to bring foods from other localities back to her home in Metro Manila.

Sixty percent of the households purchase canned meat and processed meat. For instance, in HH12, 70% of meat purchases consist of canned meat. The respondent works at a bank and lives alone, and finds that storing canned goods is a convenient way to prepare quick meals at home. As a former U.S. colony, the Philippines have made canned goods available since the late nineteenth century. Over several generations, canned meats have become staples in Filipino pantries, including the ever-popular Spam. Convenience in preparing is one reason for purchasing such goods, but also convenience in storage, because these items can have longer shelf lives than fresh produce: Before the mass production of refrigeration, canned

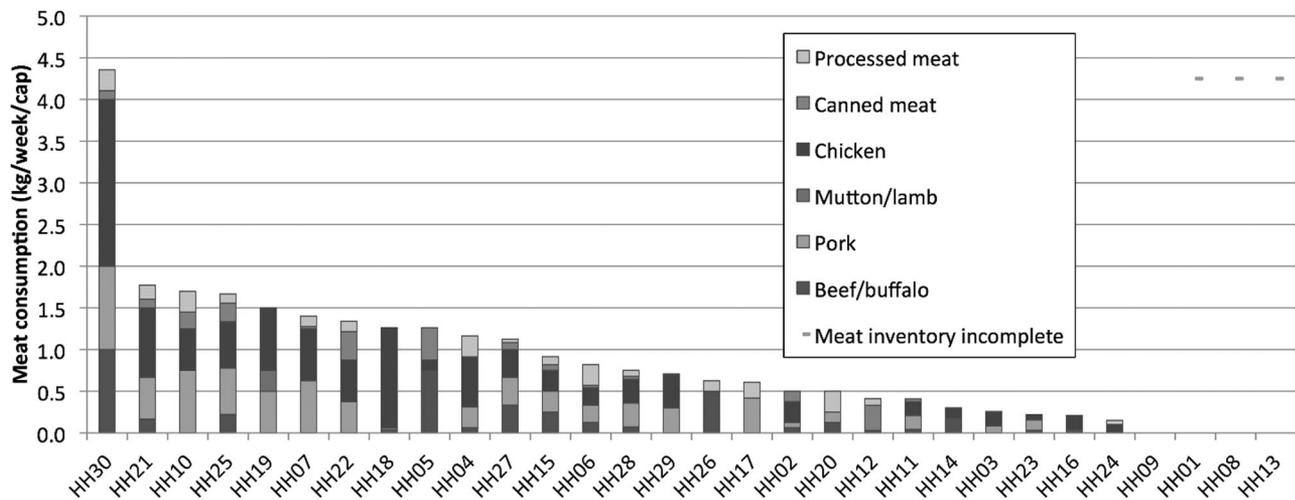


Figure 2 Household meat purchases, among the Metro Manila sample. Excluding ready-made food ordered at home and food consumed outside the household.

goods was an excellent way to store foods in a tropical climate and have food ready in emergency situations, such as flooding.

Dairy products are purchased in smaller quantities than meat products (figure 1). Consumption of powdered milk is frequently reported, sometimes in larger quantities than fresh milk. This is the case in HH04, where the mother feels that certain powdered milk brands offer vitamin supplements, which she perceives as being healthier for her small children.

Processed Foods and Imported Products

Almost all households report consuming processed food. The fraction of processed food related to the weekly food purchases ranges from 6% to 52% (figure 3). Bread, processed meat, and fish (including canned meat) and ice cream are reported most frequently. Instant noodles are also popular and can be purchased in stores across the country, related again to convenience in storage and preparation.

Whereas 77% of respondents claimed that they purchase imported foods, it was not possible to quantify these products. Related to this was the lack of knowledge about the origin of food items: When asked where milk comes from, for example, one respondent answered “the supermarket” and was unable to suggest as to whether the milk was imported or drawn from cows in the Philippines.

Beverages

Beverages quantities consumed by households vary greatly (figure 4). Converted to mass, beverage purchases exceed food purchases in most of the households. The main part consists of water, except HH17, where cold drinks make up for a similar amount as water (to avoid double counting, milk is not included as beverage, but as dairy product). Though tap water in Metro Manila is theoretically drinkable, at least in some areas, 80% of the households report purchasing water in large bottles (19 L), whereas 20% filter or treat tap water directly at home. Even in the latter case, two households mention purchasing water bot-

tles for their young children for perceptions around health and safety. Tap water is generally not perceived to be healthy and water pipes are not considered reliable. Filtered water is readily available across town, delivered mostly by men on bicycles working for small-to-medium enterprises. Households purchase water distributors, which range from manual machines, to electrical devices that generate hot and cold water. Once in possession of such an appliance, people tend to be locked into purchasing large water bottles from their local distributors.

Besides drinking, some households use drinkable water for cooking, cleaning, and washing food, again tied to perceptions around health and safety. The weekly per capita water consumption varies considerably between households, and in all cases the quantity of water consumed is low: 7.2 kg per week per capita, on average, which hardly makes 1 L per person per day, what can be considered a small amount—although household members may be drinking more outside the home.

Validating Our Findings Over Time: Macro-Level Analysis on National Trends

The macro-level analysis based on national statistics shows that between 2003 and 2009 the consumption of cereals—including rice, a staple food in the Philippines—has increased (figure 5), in terms of expenditure. This is also true for dairy products. However, what is surprising to see is that consumption of fresh fruits, vegetables, meat, fish, and eggs has actually reduced, even processed meat. This could be explained by the fact that there has been an increasing tendency either to consume already prepared food at home or to eat outside, as well as the already high cost of meat products in relation to total household expenditures.

The consumption of beverages has remained fairly constant over time, but expenditure on carbonated drinks has actually declined from 2,465 Philippine peso (PhP) in 2003 to PhP1,656 in 2009 (not shown in the figure). Similarly, consumption of

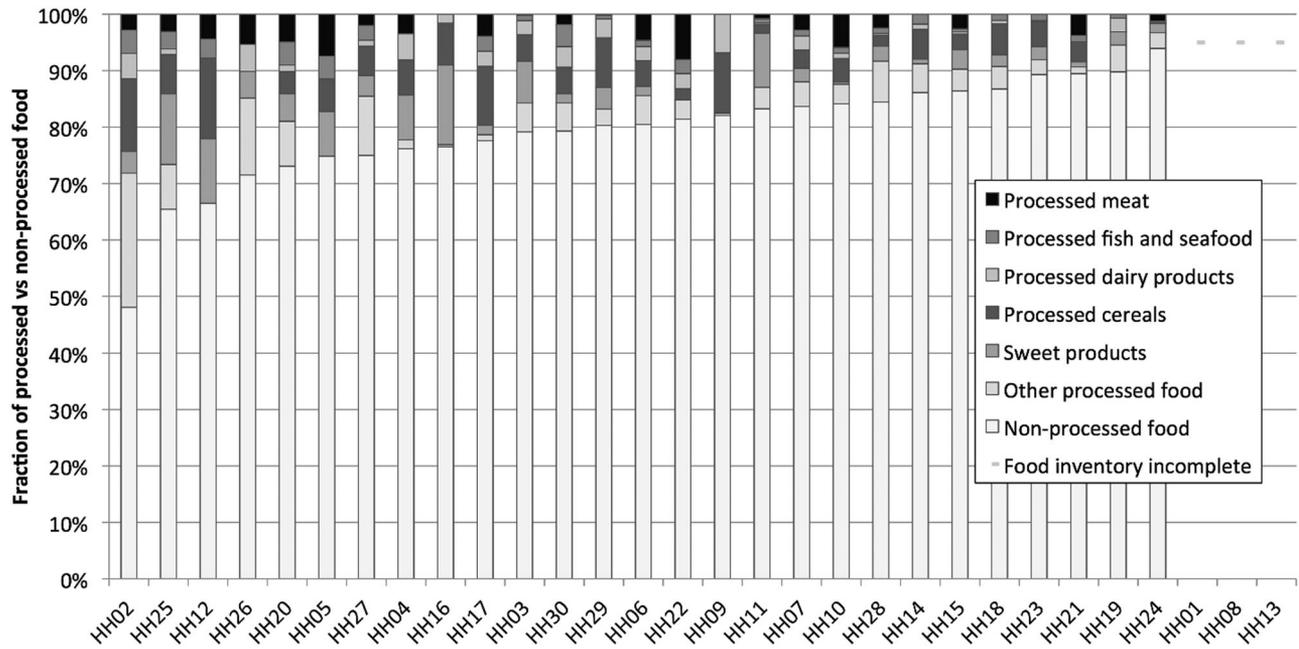


Figure 3 Processed and nonprocessed food consumption in the weekly household food purchase.

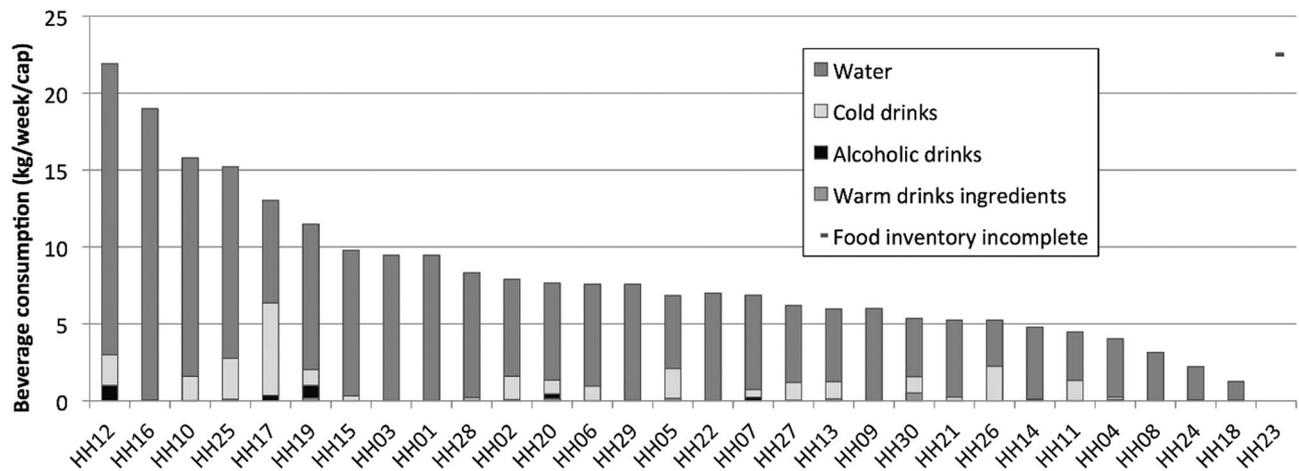


Figure 4 Beverage consumption in the households. This excludes beverages consumed outside the household.

alcoholic beverages has declined marginally at home. Because households consume more food outside the home, it is possible that the consumption of carbonated drinks and alcoholic beverages outside have also increased, which is captured in the data but difficult to disaggregate. There are no differences in consumption patterns across male- or female-headed households, including the general trend toward eating out. This is not surprising, considering the high female labor participation in the Philippines. Across age groups, there was a marginal decline in the consumption of food ordered in, among those younger than 30, but an overall increase in all other groups.

One important trend among the urban middle class in the Philippines is the increasing tendency of households to eat outside. This phenomenon seems to be more prevalent among younger (25 to 40 years) and middle-age groups (41 to 55 years), yet the tendency to eat out increased for all age groups and also

household size (figure 6) and is considered to be a significant trend at the national level. Average annual food expenditure on eating food outside increased from 17% in 2003 to 20% in 2009. Most of the expenditure is on eating meals at work, which increases consistently with the size of the household, implying that households with more working members spend more income on food at the workplace. Similarly, there is an increase in expenditure on meals at school across all household sizes. This could imply that because of the availability of cheap meals at school and at work, households prefer to consume out. Based on observations gathered during fieldwork, the cost of eating out varies widely: A meal of meat and rice can be purchased for PhP50 at a roadside *carinderia* or eatery; for PhP80 in a workplace cafeteria; for PhP90 at a fast food restaurant; or for PhP220 at a restaurant that caters to middle-class groups (often entailing larger food portions). Whereas 200 grams of raw

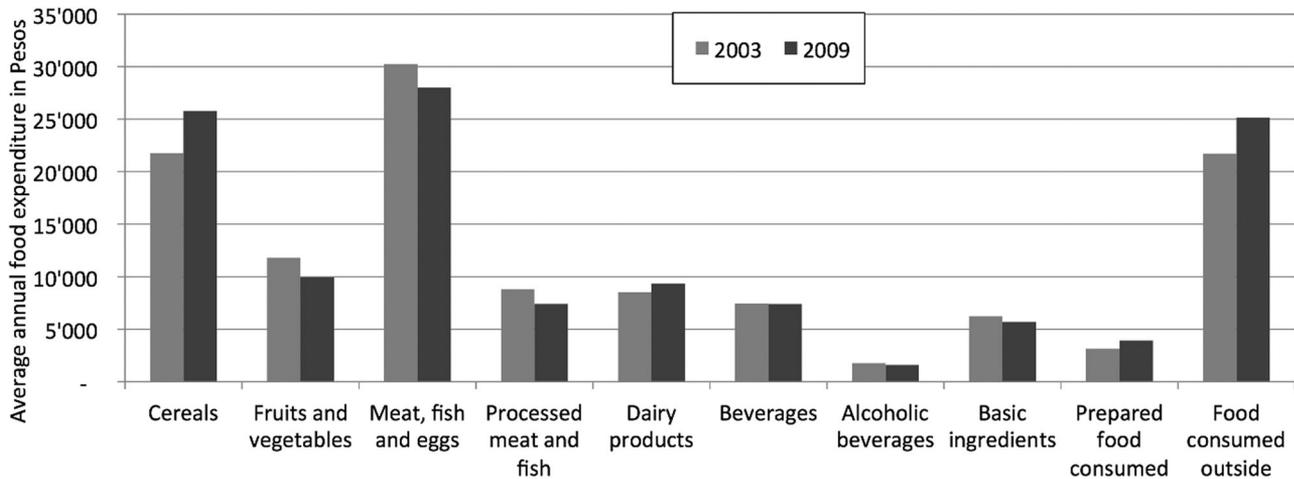


Figure 5 Food consumption expenditures among the middle classes in Philippines, all households (real values, base year 2006).

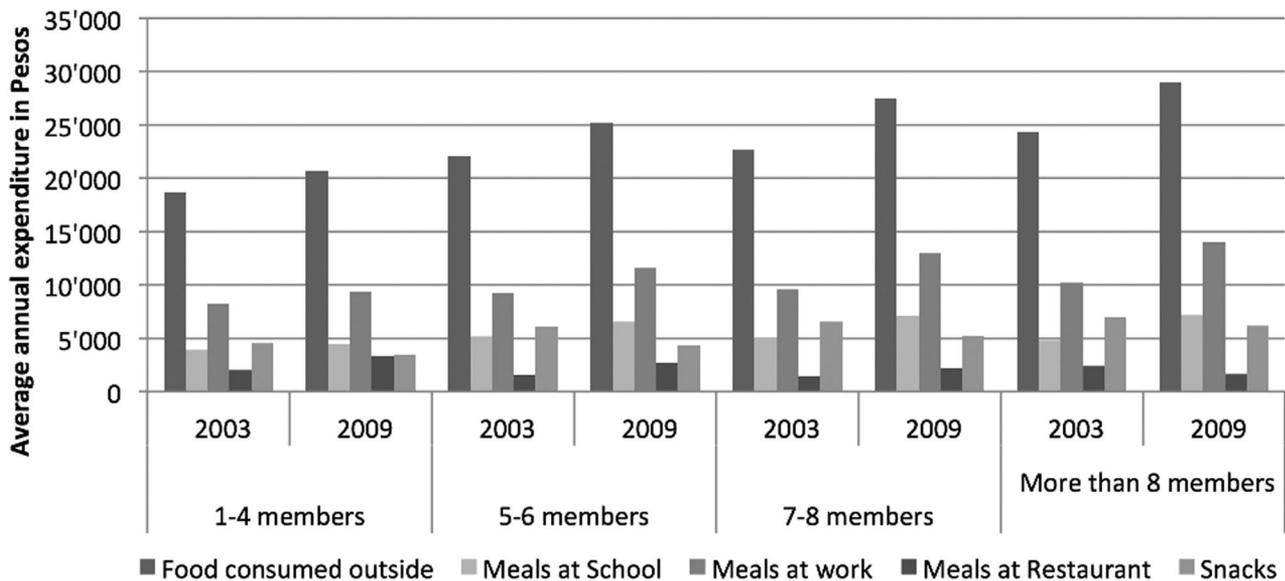


Figure 6 Food consumption expenditures outside of home, by household size among the middle class in the Philippines.

pork costs around PhP40, purchasing all ingredients to make a similar meal at home would most likely represent a higher total cost for a single person, if we were to include rice, cooking oils, gas, and electricity for cooking, electricity for cooling spaces (fan or air-conditioning), in addition to the time needed to prepare the meal and increasingly small size of cooking spaces—particularly in new condominiums (Saloma 2015).

Eating in restaurants is more popular among households with smaller family size (one to four members) than bigger families, which can be related to the cost of eating out. Eating in becomes more attractive in terms of volume of food purchased, prepared, and consumed. In households where the family size is less than four members, around 50% have single earning members, and around 40% are dual earners; in the remaining households, there are more than two earning members. The tendency to eat out among these households could be owing to lack of time given that both the male and female members work. With easy

access to fast food between work place and home, it becomes convenient to eat out rather than cook. The average food expenditure among households has increased over time, which can partly be explained by rising prices, but also by changing consumption practices related to eating out. The inflation rate in 2003 in Philippines was around 3.1% and increased in the subsequent years before declining to 3.2% in 2009.

Environmental Impact of Food Consumption Patterns and Practices

In this section, we consider the environmental impacts of different food categories that we found to be significant in our research. Starting with meat consumption, the total LCA environmental impacts of meat are higher than vegetarian food by a factor of 7 to 9 times, depending on different geographical areas, climate, soil characteristics, crop rotation cycles, and different

sorts of inputs for cultivation (Jungbluth 2000; Jungbluth et al. 2000). Grazing animals have higher environmental impacts compared to poultry and pork, given that the overall impact of meat products is primarily governed by agricultural production of feedstock and the efficiency of conversion of this feedstock to animal mass (Jungbluth 2000). Since the 1960s and 1970s, the Philippines adopted measures of the Green Revolution and increased its consumption of chemical fertilizers and pesticides in the agricultural production of feedstock and food (World Bank 2011b). Livestock in the Philippines is also a large consumer of genetically modified feedstock, including cottonseeds products and corn (Lucas 2014).

In 2010, the Philippines was consuming 149 kg of nitrogenous, potash, and phosphate fertilizers per hectare of arable land, well above the world average consumption of 132.6 kg/ha (World Bank 2011b). Such heavy use of chemical fertilizers and pesticides over the years is related to several local and global adverse environmental impacts, including (1) loss of fish stocks and weedy green vegetables that traditionally coexisted with rice paddies, (2) reduction in the diversity of fish and frog species found in paddy fields (Layosa 2007), and (3) increased GHG emissions resulting from consumption of chemical fertilizers and pesticides. Methane released from reared livestock for food production is also known to be a significant contributor to global GHG emissions (FAO 2008; Watson et al. 1992; IPCC 2007). In addition, excessive use of fertilizers may contribute to the loss of valuable nutrients such as phosphorus (Childers et al. 2011).

In general, processed food has higher environmental impacts compared to fresh produce (Kroyer 1995). For food that has to be industrially processed at the preretail stage, impacts can be extremely high. For example, the processing of bread contributes up to one third of its total impacts (Andersson and Ohlsson 1999). In contrast, food packaging is seen to be of minor importance in terms of LCEIs (Jungbluth et al. 2000). In Switzerland, food packaging is measured to make up only around 7% of the weight of sold food (Faist et al. 2001), although this does not account for food sold in the dining sector. Whereas environmental impacts of food packaging are significant, its role in keeping food safe and unspoiled is important: Food packaging can be important in reducing the total LCEI of a food product (Andersson et al. 1998; Williams et al. 2012), particularly in cases where the environmental impact of the food is relatively higher than its packaging, as is the case with perishable foods such as cheese or bread.

In cases where tap water is potable, municipal systems for water distribution have much lower environmental impacts compared to single-use bottles (Nessi et al. 2012; Dettore 2009). In the United States, tap water consumes 11 to 31 times less energy than single-use bottles and outperform bottles with respect to life cycle energy, solid waste, GHG emission, and water use (Dettore 2009). Studies are lacking on the impact of home filtered water compared to water delivered from community filtering stations, as is the case in Metro Manila.

As a result of their considerable consumption of meat, dairy, and packaged food, the urban middle classes in Metro Manila are predicted to have much higher LCEIs compared to other populations who consume less of these products. The LCA damage

categories potentially relevant with respect to the consumption patterns observed are climate change resulting from GHGs, ecosystem quality resulting from aquatic ecotoxicity, eutrophication, terrestrial acidification/nitrification primarily resulting from the high use of chemical pesticides and fertilizers to grow food for animals and land used for grazing and animal rearing, and resource depletion resulting from nonrenewable energy use.

Conclusion

The middle class in Metro Manila represents a diverse group of people whose consumption patterns and practices can relate to many factors. We found that eating out has become an important practice, a finding that was substantiated through the analysis of national surveys. This trend merits further research, given that it causes a shift of resource consumption, such as food, electricity, and gas, from households to the service sector. Food and packaging waste (including one-time-use containers, cutlery, and napkins) could also increase when eating out. In addition to entertainment and leisure, convenience and cost-effectiveness were identified as key factors for both eating out and ordering in, whereas the presence of domestic helpers tends to counteract this trend. Quantitative household consumption surveys might overlook this shift and underestimate the actual consumption of households. The mismeasurement of eating out in consumption surveys of developing countries has been highlighted in the literature; in India, missing data on eating out are identified as one reason for inconsistencies in calorie consumption analyses (Smith 2013). The increasingly global discourse around food waste presents households as playing an important role in reducing such waste; yet food waste in the service industry could be prioritized for further research and policy action. Resource efficiency measures to reduce food waste or food-related waste in urban centers, as well as to close nutrient cycles, may be more effectively achieved within the dining industry, rather than at the level of individual homes.

As we have shown, the practice of food consumption is very much a “local” affair, embedded in specific cultural contexts and related to historical trajectories and institutional settings. Yet, food consumption patterns at the local level have implications in terms of regional and global impacts. Our impact assessment review suggests that middle-class food consumption practices in Metro Manila probably exert a high pressure on the environment, particularly in relation to meat and dairy products, processed and imported food, and beverages, specifically bottled water. This effect might be exacerbated with time. For instance, per capita meat consumption is growing at a faster rate in Asia than in other regions of the world, across all meat types (OECD-FAO 2013). A detailed impact assessment based on local data sets is recommended to substantiate this hypothesis, in order to deliver relevant policy recommendations: for example, comparing impacts of bottled water through city-wide or household-level filtering technologies.

We observed a recurrent presence of processed products among the surveyed households, driven mainly by convenience

and cost-effectiveness. Whereas most households recognize processed foods as being unhealthy, some people associate processed products, such as powdered milk and bottled water, with higher levels of hygiene and safety. The nutritional quality and environmental implications of processed food, as well as perceptions around these products, would merit further exploration. Consumption of processed food is associated with the “nutrition transition” of developing countries, and potential health-related implications are obesity, diabetes, and other nutrition-related chronic diseases (Monteiro et al. 2010a).

The value of combining both qualitative and quantitative readings of household food consumption was clearly demonstrated in this research, given that food quantities could not be properly understood without qualitative discussions with household members. Contextualizing quantitative findings socially and culturally provided new insights on the observed patterns. In turn, quantitative findings raised interesting figures that could be further investigated through in-depth interviews. One of the limits of our research was in the use of memory recall methods, both in our empirical research at the household level, and in our analysis of national surveys. Common errors arising from this methodology are associated with memory, motivation, knowledge, and communication (Bradburn et al. 2004). The difficulty of estimating quantities, such as water consumption, is a potential source of under- or overestimation in our data. The issue of incomplete knowledge about household purchases should also be raised: We were more confident with our results when interviewing the head of a family responsible for food purchases, rather than a young individual sharing a living space with flat mates and managing their expenditures independently. Memory recall could be complemented by other methods, including measuring flows and weighing foods among households.

Literature on new consumer food consumption trends seems to focus on the high environmental impact of current and projected consumption patterns (Myers and Kent 2004). What we have emphasized in this study is that food consumption is not solely a biophysical flow, but also relates to the flow of perceptions and images as people and ideas travel across the globe. Food consumption in Metro Manila has always been influenced by colonial trade routes, but these flows are now accelerating as a result of increased mobility and globalization. These many factors may lead to a shift in practices and must be addressed carefully in order to successfully promote more sustainable forms of food consumption.

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Note

1. These income brackets, based on the 2009 National Statistics Office definition of the middle class, include: lower middle-class: PhP280,000–PhP980,000; average middle class: PhP981,000–PhP1,700,000; upper middle class: PhP1,700,000–PhP2,300,000. One household did not report their income category. In May 2013, PHP100 equaled approximately US\$2.

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