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You are what (and where) you eat: Capturing food away from home in welfare measures☆

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ABSTRACT

Consumption of food away from home is rapidly growing across the developing world, and will continue to do so as GDP per person grows and food systems evolve. Surprisingly, the majority of household surveys have not kept up with its pace and still collect limited information on it. The implications for poverty and inequality measurement are far from clear, and the direction of the impact cannot be established a priori. This paper exploits rich data on food away from home collected as part of the National Household Survey in Peru, to shed light on the extent to which welfare measures differ depending on whether food away from home is accounted for or not. Peru is a relevant context, with the average Peruvian household spending over a quarter of their food budget on food away from home since 2010. The analysis indicates that failure to account for this consumption has important implications for poverty and inequality measures as well as the understanding of who the poor are. First, accounting for food away from home results in extreme poverty rates that are 18 percent higher and moderate poverty rates that are 16 percent lower. These results are also consistent, in fact more pronounced, with poverty gap and severity measures. Second, consumption inequality measured by the Gini coefficient decreases by 1.3 points when food away from home is included – a significant reduction. Finally, the inclusion of food away from home results in a reclassification of households across poor/non-poor status – 20 percent of the poor are different, resulting in small but significant differences in the profile of the poor in dimensions such as demographics, education, and labor market characteristics. Taken together, the results indicate that a serious rethinking of how to deal with the consumption of food away from home in measuring well-being is urgently needed to properly estimate and understand poverty around the world.

1. Introduction

Consumption patterns are rapidly changing across the developing world, with prepared and packaged meals and meals consumed outside the home taking an ever growing share of the households' food budget.[1] Furthermore, with rising incomes, urbanization, and women entering the labor force, among various reasons, this trend is expected to persist as economies transition to middle-income status (Smith, 2013; USDA, 2011).

In spite of its growing participation in households' budgets, most nationally representative household surveys have not kept up with the pace and collect very limited information on food away from home (FAFH). Conceptual and practical challenges make integrating FAFH in household surveys a complex exercise. For example, we need a clear protocol to capture otherwise confusing items such as meals produced outside but consumed at home – or vice versa; we need to measure meals whose content is unknown to the consumer and which are consumed in non-standard quantities. In addition, we are confronted with the likely high measurement error that arises if we elicit the information from a household informant – a common practice in household

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[1] FAFH has been found to contribute to as much as 36 percent of the daily energy intake among men in urban Kenya, and 59 percent among market women in urban Nigeria (Oguntona and Tella, 1999; Van't Riet et al., 2002). Among the younger population, FAFH contributes, for example, to 18 and 40 percent of daily energy intake among Chinese children and school-going adolescents in Benin, respectively (Liu et al., 2006; Nago et al., 2010).

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surveys, when the consumption takes place out of the home and therefore out of sight of the informant.[2]

As a result, in practice, few countries have addressed these survey design issues adequately, as shown by a recent comprehensive assessment done by Smith et al. (2014). To assess the relevance and reliability of food data, the authors analyzed the questionnaire content of the most recent nationally representative consumption or expenditure household survey from 100 developing countries, which represents 70% of the developing countries. Among various quality indicators, the coverage and detail of FAFH data are analyzed. Following a very lax definition of FAFH, which consists of checking whether "any food item in the food list itself, the title of the section in which it is found, or a question regarding the item, contains words such as consumed out, restaurant, consumed away, and the like", it turns out that 90 percent of the surveys do consider FAFH in some form. However, when looking more deeply into the way this information is collected the authors find huge variation in quality, painting a far from optimal picture in the collection of FAFH data. For example, a quarter of the surveys aim to capture all related household consumption from FAFH using just one question; one in five surveys considers multiple places of consumption; only 35 percent takes snacks explicitly into account (when most snacking is expected to take place out of the home); and close to half of the surveys do not include FAFH received in kind.

Poor measurement of FAFH may have far reaching consequences in welfare analysis. Food consumption plays an instrumental role in the design and monitoring of development policy at the local, national, and global levels. Poverty, food security, health, and nutrition, lie at the heart of the development agenda, and the computation and monitoring of indicators that track those welfare dimensions rely heavily on food consumption or expenditure data. While data on household consumption or expenditure have dramatically increased over the last few decades[3], appropriate information on FAFH patterns is lacking, and the consequences of miss-measurement of food consumption on the assessment and understanding of these major policy areas are largely unknown. Furthermore, as FAFH is expected to gain importance as economies develop, appropriately measuring this component constitutes an urgent issue or overtime comparisons of consumption patterns and poverty will become less meaningful over time.

To the best of our knowledge, only two papers analyze the implications that failing to account for FAFH can have on food security analysis.[4,5] In a study from India, Smith (2013) argues that the great *Indian calorie* debate, originated by an apparent increase in undernourishment at the time of falling poverty rates, can be partly explained by inaccurate data on calorie intake due to the lack of measurement of FAFH. Similarly, Borlizzi and Cafiero (2014) in Brazil show how the distribution of food consumption by income strata changes once food consumed at school is taken into account. In particular, they show that proper account for food received through a school feeding program targeted to the poorer population results in a more equal distribution of food consumption than previously thought, allowing for a long due revision of the FAO assessment of undernourishment in Brazil.

In this paper, we evaluate the impact of accounting for FAFH on poverty and consumption inequality estimates in Peru.[6] Drawing on rich FAFH data collected as part of the multi-year National Household Survey (ENAHO), we simulate a situation where we move from a world where FAFH is not accounted for to one where it is. In the process, we show that from a theoretical point of view the direction of the effect on poverty or inequality cannot be predicted ex-ante. Peru is a relevant context to study this question since FAFH is fairly widespread and increasing. In 2013, the average Peruvian household spent 27 percent of their food budget on FAFH.

To assess the impact on poverty measurement, we follow the official methodology adopted by the National Institute of Statistics and Informatics (INEI) and start with a scenario where FAFH is not accounted for. Then, we use this estimate as the benchmark against which the impact of including FAFH is assessed. Peru updated its poverty measurement methodology in 2010, and therefore we use that year for our analysis. The definition of FAFH included in the ENAHO comprises all food *prepared outside* the home. We estimate the effect of FAFH on the poverty rate, the poverty gap, and the severity of poverty. Then, to evaluate the effect on consumption inequality we compute the Gini coefficient based on the expenditure distribution with and without FAFH. Finally, we go beyond a summary welfare measure and analyze whether lack of accounting for FAFH changes our understanding and characterization of the poor population, by looking at how the profile of the poor changes once we take into account FAFH.

Our analysis indicates that failure to account for FAFH has significant and sizable effects on poverty and inequality indices and to our understanding of poverty in general. First, accounting for FAFH results in extreme poverty rates that are 18 percent higher and moderate poverty rates that are 16 percent lower than the scenario without FAFH. The increase in the extreme poverty rate is driven by the higher per-calorie costs derived from FAFH relative to food prepared at home, which increase the cost of the food basket and therefore the poverty line. In contrast, the moderate poverty rate falls because the increase in measured household consumption, which comes from accounting for FAFH, offsets the rise in the moderate poverty line. These effects are also consistent, in fact more pronounced, when we compute changes in the poverty gap and severity of poverty. Second, consumption inequality not only falls among the poor (severity of poverty), but also across the entire population. When including FAFH, the Gini coefficient falls by 1.3 points.

Finally, accounting for FAFH also generates a re-ordering of households along the consumption distribution. Overall, 41 percent of the population changes their relative ranking when measured by the percentile of the expenditure distribution they belong under each scenario. This generates a reclassification of the population across poor/non-poor status – about 20 percent of the poor population is different, resulting in small but significant differences in the profile of the poor when measured by demographic and socio-economic characteristics.

The remaining of the paper is organized as follows: Section 2 connects FAFH to welfare and discusses the impact that FAFH has on the poverty and inequality indicators analyzed in this paper as well as on the profile of the poor; Section 3 introduces the setting and data, including details on the official methodology INEI implements to compute

[2] In a small-scale study in an urban slum in India, Sujatha et al. (1997) interview spouses about the men's dietary intake, and find that women are not aware of the foods consumed by their spouses outside their home. Similarly, Gewa et al. (2007) find that mothers of rural school-aged Kenyan children missed 77 and 41 percent of the energy intake originated in FAFH in the food shortage and harvest seasons, respectively (where FAFH contributes to 13 percent and 19 percent of daily energy intake in each season).

[3] The 1990 World Bank World Development Report on Poverty relied on data from only 22 countries, and no country had more than one survey. Today, there are more than 850 surveys from 125 countries with consumption or expenditure data (Ravallion and Chen, 2011).

[4] With obesity increasingly becoming a pressing health issue in some middle-income countries, the link between eating out and obesity is also drawing attention in the developing world (Bezerra and Sichieri, 2009; Lozada et al., 2008).

[5] The literature on FAFH in the developed world has a longer history, where a main focus has been on health and nutrition issues. There is widespread interest in studying the differences in the nutritional composition of the food provided by commercial outlets relative to home-made food, aiming to understand the health consequences of eating out (Vandevijvere et al., 2009). In particular, there is a body of research devoted to understand the link between obesity and eating out, among other health outcomes (Burns et al., 2002; Guthrie et al., 2002; Kant and Graubard, 2004; Le Francois et al., 1996; Lin and Guthrie, 2012; Binkley et al., 2000). There is also interest in establishing food-based dietary guidelines to prevent obesity and related chronic diseases (Kearney et al., 2001; O'Dwyer et al., 2005).

[6] A few papers analyze the impact of different aspects of survey design on total expenditures, and poverty and inequality measures (Backiny-Yetna et al., 2014; Beegle et al., 2012; Deaton and Grosh, 2000; Gibson et al., 2003; Jolliffe, 2001; Pradhan, 2001). The work by Backiny-Yetna et al. (2014) is the only one to look in particular at the impact of food consumption data collection methods on poverty and inequality.

poverty statistics; Section 4 presents the results; and Section 5 concludes.

2. Integrating food away from home in welfare analysis

While it is well understood that welfare is multidimensional, consumption has long been considered a flagship summary welfare indicator. In developing countries, where food consumption represents a high share of total consumption, mismeasurement of food consumption can have far reaching implications on welfare analyses. In this work, we study the impact that accounting for FAFH has on monetary poverty and inequality analyses.

2.1. FAFH and monetary poverty

Under a monetary approach, the poor are those individuals whose resources – measured through consumption (or income) – fall below an 'adequately' defined threshold (the poverty line). Most countries track two levels of poverty: extreme and moderate. Extreme poverty is associated with a poverty line that reflects the cost of acquiring a food basket that satisfies minimum calorie requirements. [7,8] Moderate poverty also includes the cost of satisfying other essential needs. In general, both lines are set based on the consumption patterns of a selected group called 'the reference population'.

The choice of goods that conform the food basket and their prices is not trivial, and today there is wide heterogeneity in the methodology followed across countries. The fact that FAFH calories are, in general, more expensive, may raise further questions as to whether such consumption should be included. At the end, the choice is up to each country. One approach, followed by Peru among others, consists of selecting the basket based on the consumption patterns of the population whose consumption is around the poverty line, under the rationale that those households consume in a way such that their basic needs are met. The objective is to use real costs as faced by households, without imposing constraints inconsistent with their behavior, under the assumption that households are rational in their consumption patterns. With respect to FAFH, it can be argued that in today's world eating out is not a choice but a necessity. Urbanization, long working hours far away from place of residence, or women entering the labor force, are among some of the factors that explain changes in eating patterns. Furthermore, the increased demand for FAFH has been accompanied by an expansion of options including the proliferation of street foods, making calorie prices faced by those at the lower end of the distribution much lower than prices at the top.

There is far less agreement as to how to calculate the moderate poverty line. A widely used methodology, followed by Peru, relies on the relative participation of food and non-food items in the household budget to back-up non-food costs.

Therefore, FAFH can affect poverty measurement through two channels: the estimation of household consumption and the estimation of the poverty lines. Let $P(z,f(x))$ be a poverty index, with z the poverty line and $f(x)$ the consumption distribution, a change from a world without FAFH to one with FAFH can be expressed as:

$$\Delta P = P(z_1 f_1(x)) - P(z_0 f_0(x))$$

where subscript 0 and 1 refer to poverty without and with FAFH, respectively.

To quantify the impact generated by the change in consumption (*expenditure effect*) and the impact generated by the change in the poverty line (*poverty line effect*), we decompose the previous expression in the following way:[9]

$$\Delta P = \frac{1}{2}[P(z_0 f_1(x)) - P(z_0 f_0(x)) + P(z_1 f_1(x)) - P(z_1 f_0(x))] + \frac{1}{2}[P(z_1 f_0(x)) - P(z_0 f_0(x)) + P(z_1 f_1(x)) - P(z_0 f_1(x))]$$

In words, the expenditure effect represents the change in the poverty index resulting from the change in the consumption distribution, holding fixed the poverty line. Similarly, the poverty line effect represents the change in the poverty index resulting from a shift in the poverty line, holding constant the consumption distribution.[10]

2.1.1. Expenditure effect

Moving from a world without FAFH to one that measures FAFH has a relatively straightforward impact on overall household consumption: everything else equal, every household has higher total measured consumption.[11] In other words, the whole consumption distribution shifts to the right, and among the indices most commonly used, this lowers poverty.

2.1.2. Poverty line effect

Since the extreme poverty line is meant to reflect the cost of acquiring a food basket that satisfies minimum calorie requirements, the impact of including FAFH will depend on the relative calorie costs of food items included and excluded under each scenario: the poverty line will go up (down) if calorie requirements are satisfied at higher (lower) costs when including FAFH.[12]

The change in the moderate poverty line will depend on: (a) the change in the value of the food basket, and (b) the change in the relative cost between food and non-food items. Since accounting for FAFH increases the expenditure share allocated to food and therefore decreases the relative cost of non-food items (i.e. for any given cost of the food basket, fewer resources need to be added to get to the moderate poverty line), the direction of the net effect will depend on the direction of (a) and the relative magnitude of (a) and (b).[13]

Once again, for most common poverty indexes the direction of the change in the poverty line determines the direction of the change in the poverty index.

2.1.3. Overall effect

The final effect on the poverty index will result from the sum of the expenditure and poverty line effects. If both effects move in the same direction, there can be a significant change in the poverty index even when both the expenditure and poverty line effects are small in magnitude. Similarly, if the effects move in opposite directions, the net effect can be quite small even if both the expenditure and poverty line effects are substantial.

2.2. Consumption inequality

Well-being not only depends on the levels of deprivation – i.e. poverty, but also on the distribution of resources across the population.

[7] This corresponds to the 'cost of basic needs approach' which is the most commonly used. Alternative methods include the food energy intake approach and subjective evaluations.

[8] Internationally agreed recommendations on calorie requirement are provided by FAO/WHO/ONU, and differentiate by gender, age, and physical activity levels.

[9] We follow a similar approach to Kakwani (2000).

[10] If one measured the changes sequentially, the magnitude of each effect would depend on the order in which they are computed. To avoid such arbitrary choice, the decomposition measures the expenditure effect as ½ the change due to the shift in the consumption distribution under the original poverty line and ½ the change due to the same shift in the consumption distribution computed under the new poverty line. A similar reasoning applies to the poverty line effect.

[11] This assumes that the inclusion of FAFH in the survey does not lower reports of other consumption items.

[12] The fact that the reference population changes across the two scenarios may result in different calorie requirements. Among all simulations done, the change in calorie requirements is very low (the maximum change is 4 kilocalories from a total of 2105).

[13] An additional effect comes from the change in the composition of the reference population. In practice, this effect is trivial relative to the impact of accounting for FAFH on the food share when keeping fixed the reference population.

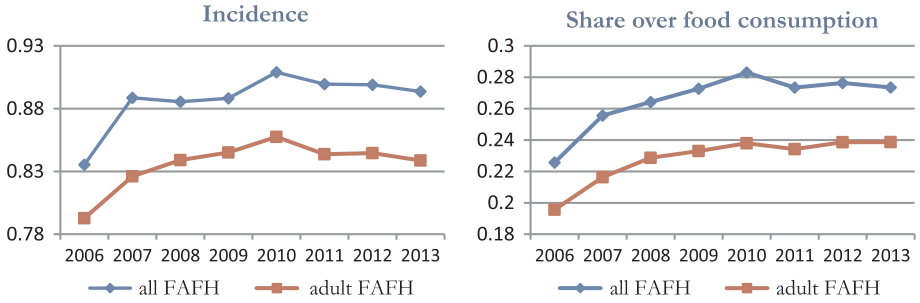

Fig. 1. Recent trends of FAFH in Peru..
Source: own calculations based on ENAHO 2006–2013

It is increasingly recognized that high levels of inequality is detrimental to development and therefore development policy should focus, not only on growth, but also on inequality. The impact that proper measurement of FAFH can have on consumption inequality depends on the degree to which the incidence and magnitude of FAFH consumption varies along the consumption distribution, and cannot be established ex-ante.

2.3. Re-classification and poverty profile

Unless all individuals consume the same amount of FAFH (or consume progressively more as we move along the distribution), the shift from a distribution without FAFH to one with FAFH results in a re-ordering of individuals. If this re-ordering is big enough, the identity of those individuals falling at the lower end of the distribution will change.

This has two important implications. On the one hand, it affects the identification of the poor population leading to a re-classification across poor/non-poor status. On the other hand, it changes the composition, and therefore the characterization of the poor population. There are no strong a priori predictions as to how the profile would change, aside from the fact that those likely to leave poverty are individuals who eat more outside and those who fall into poverty are individuals more likely to eat at home. Therefore, correlates with eating out such as household composition, education, and labor market outcomes are likely to differ across those who change their poverty status.

3. Setting and data

Peru is a middle-income country that has experienced sustained GDP growth over the last decade. Poverty has been steadily declining over time, with moderate poverty falling from 58.7 to 23.9 percent and extreme poverty from 16.4 to 4.7 percent between 2004 and 2013. Likewise, consumption inequality has declined to reach a Gini coefficient of 35 in 2013.

3.1. Consumption data

Data comes from the National Household Survey – ENAHO, a multi-topic household survey that has been collected annually since 1995, and is the main source of information to monitor the living standards of the population.

The survey has an extensive and detailed household consumption module reported by a household informant. Within the food consumption module we can separately identify food prepared and consumed at home, food produced outside but consumed at home (take-out), and food consumed outside the home by children. Additionally, the survey has an individual-level module on food consumed outside the home applied to each adult household member. Consumption is reported by meal event – breakfast, lunch, dinner, or snacks, and individuals report frequency, amount spent, and place of consumption, such as street food, restaurant, social program, or work. Following the country's definition, FAFH includes: (a) take-out; (b) food consumed away by children, and (c) food consumed away by adults.

The high quality of the FAFH data makes this survey well suited for this analysis. The survey takes into consideration most of the elements reviewed by Smith et al. (2014). It considers both food produced outside and consumed outside as well as food produced outside but consumed at home (take-out); it contemplates different modes of acquisition – paid versus in kind; it explicitly considers meals and snacks; and it accounts for multiple sources of FAFH. Furthermore, this survey is among the few in the world that collect FAFH at the individual level.[14]

3.2. Descriptive statistics on FAFH

FAFH is fairly widespread in Peru, and despite its high incidence it has continued to grow over the last few years (Fig. 1, left panel). In 2006, 84 percent of the households reported having at least one household member eating away from home. By 2013, almost 9 out of 10 households have a member who eats at least a meal or snack out. If we focus on adult consumption, the trend presents a similar pattern, only shifted about 5 percentage points downwards.[15]

Not only the incidence but the contribution of FAFH to the food budget is substantial (Fig. 1, right panel). Between 2006 and 2013, the share of FAFH on food expenditures increased by 21 percent, from 23 to 27 percent. This is largely explained by adult consumption, which represents in 2013 almost a quarter of households' food consumption.

In addition, FAFH is quite relevant for consumption levels. Fig. 2 presents for the year 2010, (a) the absolute amount spent on FAFH and (b) the share of expenditures on FAFH over total expenditures, by percentile of the expenditure distribution without FAFH. We can see that, while the absolute amount spent on FAFH increases along the expenditure distribution, the share of FAFH on total expenditures is higher at the lower end of the distribution. Understanding the drivers of FAFH behavior is beyond the scope of this work. However, it is consistent with worldwide trends linking FAFH with urbanization and labor market dynamics, and it is evident that FAFH is part of everyday life among the Peruvian population.

3.3. Poverty methodology in Peru

The main source of information for poverty measurement is ENAHO. Peru went through an important methodological change in poverty measurement in 2010, when a new food basket was selected and new poverty lines computed. Therefore, our main analysis corresponds to the year 2010.[16]

[14] Only 17 percent of the surveys reviewed by Smith et al. (2014) collect individual-level information, and even fewer elicit the information from each individual respondent.

[15] In the measurement of adult consumption we only include meals produced by commercial sources. While the questionnaire asks for consumption provided by social programs, the valuation of such consumption is controversial, thus we abstract from that component. Information on food consumed at other households is also reported, but in order to avoid double count of meals INEI excludes that component in the computation of total household consumption.

[16] We also present estimates for the period 2010–2013. After 2010, the poverty lines are updated only to account for price inflation.

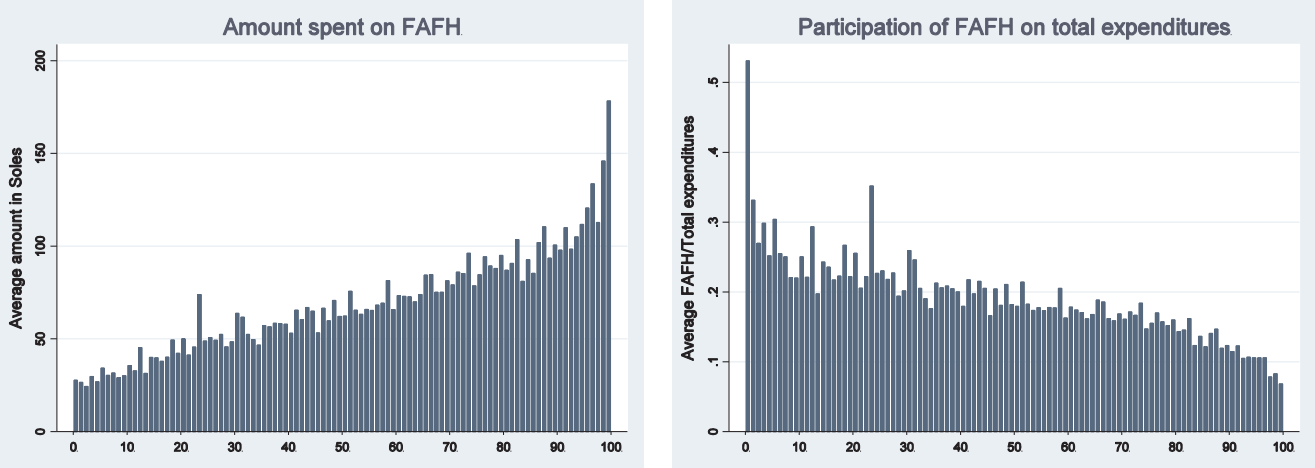

Fig. 2. Distribution of FAFH expenditures, by percentile of the expenditure distribution without FAFH. Notes: own calculations based on ENAHO 2010. Amount spent on FAFH expressed in monthly Soles of Lima Metropolitana for 2010.

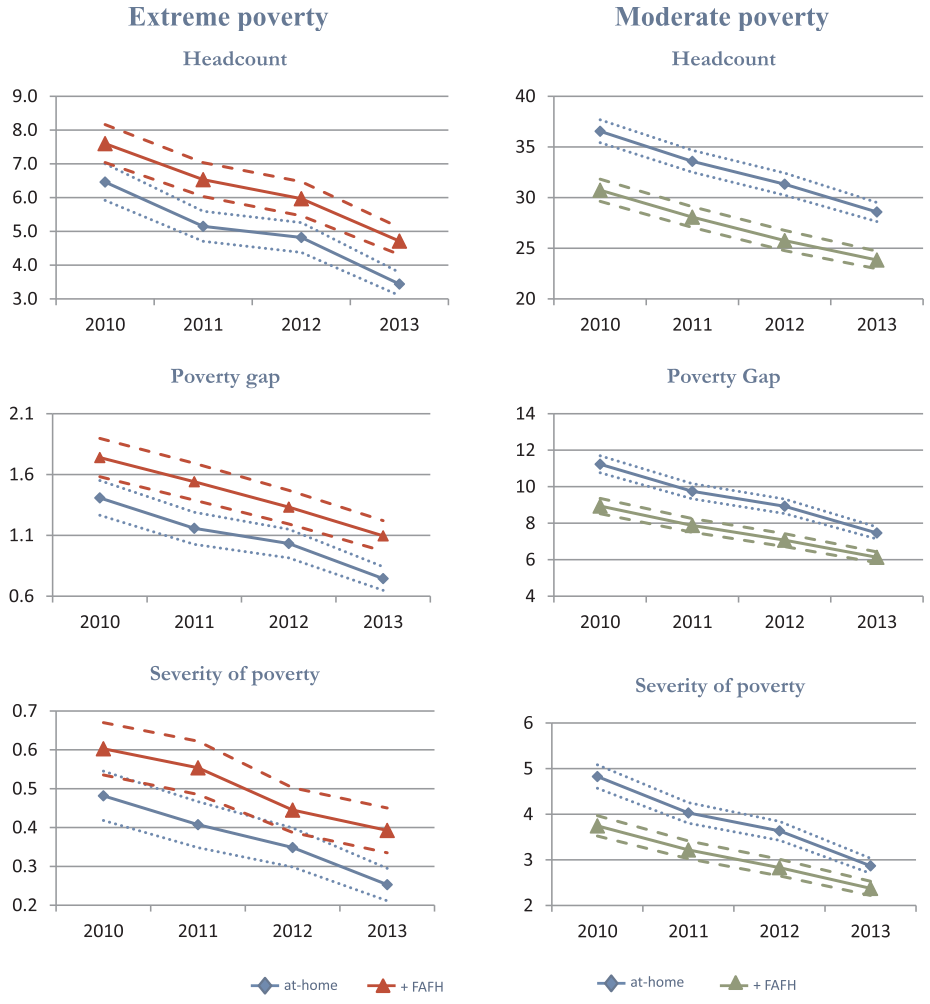

Fig. 3. Impact of FAFH on poverty indexes, Peru 2010–2013. Notes: own calculations based on ENAHO 2010–2013. Dashed and dotted lines indicate the 95% confidence intervals.

The selection of the food basket is based on the household and individual consumption reported in the ENAHO by the reference population, which in Peru corresponds to those individuals between the 20th and 40th percentile of the per capita expenditure distribution.

Three pieces of information are necessary for the selection of the food basket: calorie content, quantity consumed, and value. Caloric composition of each food item comes from a nutritional table computed by the National Center for Food and Nutrition (CENAN) under the direction of the National Institute of Health. This table has all 941 items reported in the household-level consumption module. Additionally, it has information on 12 'representative food items' that correspond to the individual-level food consumption module. Since this module does not have information on content, the 12 food items refer to a representative meal for each meal occasion – breakfast, lunch, dinner, and snack,

Table 1
Impact of FAFH on poverty rates, poverty gap, and severity of poverty Simulations including different FAFH components.

Place of consumption…	Extreme poverty					Moderate poverty				
	At home	At home + …			All	At Home	At home + …			All
		Meals out		Takeout			Meals out		Takeout	
		Adults	Children				Adults	Children		
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Poverty rate	**6.46**	**8.15***	**6.36**	**6.19**	**7.60***	**36.55**	**33.72***	**35.37**	**33.95***	**30.72***
Expenditure effect		−2.94	−0.2	−0.14	−3.25		−9.03	−0.63	−1.12	−10.46
Line effect		4.63	0.1	−0.13	4.39		6.2	−0.54	−1.48	4.63
Overall effect		**1.69**	**−0.1**	**−0.27**	**1.14**		**−2.83**	**−1.18**	**−2.60**	**−5.82**
Poverty gap	**1.41**	**1.88***	**1.39**	**1.35**	**1.74***	**11.23**	**9.94***	**10.76**	**10.30***	**8.94***
Expenditure effect		−0.81	−0.05	−0.03	−0.87		−3.62	−0.29	−0.35	−3.99
Line effect		1.28	0.03	−0.03	1.20		2.33	−0.18	−0.58	1.70
Overall effect		**0.47**	**−0.02**	**−0.05**	**0.33**		**−1.29**	**−0.47**	**−0.93**	**−2.29**
Severity of poverty	**0.48**	**0.66***	**0.47**	**0.46**	**0.60***	**4.83**	**4.20***	**4.60**	**4.42***	**3.75***
Expenditure effect		−0.31	−0.02	−0.01	−0.33		−1.78	−0.15	−0.14	−1.92
Line effect		0.49	0.01	−0.01	0.45		1.15	−0.08	−0.27	0.84
Overall effect		**0.18**	**−0.01**	**−0.02**	**0.12**		**−0.63**	**−0.22**	**−0.41**	**−1.08**

Notes: own calculations following the official poverty methodology using ENAHO 2010. Standard errors take into account survey design.
* Statistically significant at 5 percent level.

differentiating across three sources – street vendors, restaurants, and work.[17]

To get an estimate of the quantity of FAFH by adults, INEI uses the information available from the other two components of FAFH: take-out and FAFH consumed by children where respondents do report the specific items and quantities consumed. With this information, INEI calculates the median price per kilogram (by quartile of per-capita expenditure distribution, location, and meal type), and assigns this value to adult FAFH to back-out quantities.

With the cost of the food basket, the moderate poverty line is determined using the Orshansky coefficient or inverse of the food budget share – that measures how many times total consumption exceeds food consumption.

4. Results

4.1. Changes in welfare indicators

4.1.1. Poverty

We now evaluate the impact that the inclusion of FAFH has on poverty estimates. We focus on the FGT(α) family index, in particular the FGT(0) or head-count ratio; the FGT(1) or poverty gap; and the FGT(2) or severity of poverty.

Our baseline scenario consists of estimated consumption and poverty lines in a world where no information on FAFH exists ("at home" estimates). The resulting poverty estimates constitute the benchmark against which the impact of FAFH is assessed.

Next, we proceed to include, one at a time, the three components of FAFH: food consumed away by adults (15 and older), food consumed away by children (14 and younger), and food consumed at-home by the household (take-out). As pointed out in the previous section, FAFH by adult members is by far the largest component of FAFH. The inclusion of all three components simultaneously results in the official poverty estimates.

For each poverty index, we decompose the overall effect into expenditure and poverty line effects following the specification presented in Section 2.1. Standard errors are estimated taking into account the sample design and population weights.

Table 2
Summary statistics for poverty simulations including different FAFH components.

Place of consumption…	At home	At home + …			All
		Meals out		Takeout	
		Adults	Children		
	(1)	(2)	(3)	(4)	(5)
Extreme poverty line	101.9	134.5	102.3	101.4	134.5
Moderate poverty line	241.3	266.6	239.3	234.5	260.1
Orshansky coefficient	2.26	1.93	2.24	2.22	1.88
Median Kcal cost	0.004	0.007	0.003	0.004	0.004
Monthly pc-expenditure	444	501	446	452	512
FAFH component:					
Incidence		89.77	37.14	42.93	93.70
Share over total exp.		16.05	0.95	2.23	19.23
Share (con > 0)		17.88	17.88	5.21	20.50

Notes: own calculations following the official poverty methodology using ENAHO 2010. Statistics calculated at the individual level among the reference population. National poverty line calculated as a weighted average of the 7 regional poverty lines.

Table 1 presents the full set of results. The left panel presents extreme poverty estimates and the right panel moderate poverty estimates. For each case, the estimates of the poverty headcount, gap and severity are presented in the upper, middle, and lower panels, respectively. Finally, column (1) of each panel shows the baseline specification; columns (2) to (4) include a component of FAFH one at a time while leaving the other FAFH components out; and column (5) summarizes the overall effect of FAFH that match the official poverty statistics.

4.1.1.1. Expenditure effect. The expenditure effect provides the estimated change in poverty statistics resulting from including the different components of FAFH in total expenditures, while leaving the poverty line unchanged.[18]

Focusing on the poverty headcount, the results suggest that if information on FAFH was excluded, extreme poverty would have been

[17] This information was gathered through conversations with INEI staff. We could not access documentation specifying the process by which these representative items were selected.

[18] This effect coincides with the total effect in cases where the poverty line used comes from a different data source and is not adjusted to take into account FAFH.

6.46 percent and moderate poverty 36.55 percent in 2010. Once all components of FAFH are included, the expenditure effect implies a 3.3 percentage point reduction in extreme poverty and a 10.5 percentage point fall for moderate poverty. Both changes are sizable in an order of 30–50 percent relative to the baseline specification.

If we break FAFH into its different components, adult consumption is the main driver of the expenditure effects. Accounting for adult FAFH translates into a decrease of 2.9 percentage points in extreme poverty and 9 percentage points in moderate poverty. In contrast, accounting for FAFH consumed by children or take-out generate very small changes in the extreme poverty rate, 0.2 and 0.1 percentage points respectively, and accumulate to a change of about 1 percentage point in moderate poverty. As expected, these differences are explained by the relative small importance that each component has on the household budget.[19] Indeed, summary statistics reported in Table 2 show that adult consumption is by far the most important component, with an incidence of almost 90 percent, and a mean participation in the household food budget of about 16 percent.[20] By contrast, significantly fewer resources are assigned to child consumption or take-out (incidence is about 40 percent and participation in the household budget is at most 2.2 percent).

The same pattern follows when we look at the poverty gap and the severity of poverty. Accounting for FAFH reduces the distance between the mean expenditures among the poor and the extreme poverty line by S/0.87, and the moderate poverty line by almost S/3.99. Furthermore, the reduction is relatively stronger for those further away from the poverty line, causing the severity of poverty to fall too. Again, these effects are dominated by adult consumption.

4.1.1.2. Poverty line effect. In contrast to the expenditure effect, the direction of the poverty line effect is a priori unknown. Furthermore, the extreme and moderate poverty lines need not move in the same direction. Table 2 presents the simulated poverty lines under each scenario. We find that when all components of FAFH are accounted for, the extreme poverty line increases by S/0.33 while the moderate poverty line only increases by S/0.19 (a 32 and 8 percent increase over baseline, respectively). The increase in the extreme poverty line is explained by the higher calorie costs of FAFH relative to food prepared at home (see Table 2). When computing the moderate poverty line, the increase in the cost of the food basket is partially offset by the fall in the Orshansky coefficient, which implies that non-food items are weighted more in the moderate poverty line estimate.

The increase in the two poverty lines translates into about a 4.4 and 4.6 percentage point increase in the extreme and moderate poverty rates, respectively (Table 1). The reason the effects are similar is because of two compensating effects. In the first case, the poverty line shifts more but the effect is evaluated in a segment of the expenditure distribution with lower population density. In the second case, the poverty line moves less, but the move is evaluated in a segment of the distribution with higher population density.

The effects of FAFH by its different components vary across our scenarios. The differences in extreme poverty rates are driven by difference in calorie costs: calories from adult consumption are more expensive than calories from home-made food, but that is not the case for child consumption or take-out (Table 2). As a result, the poverty line and poverty rate change significantly when we incorporate adult consumption, but they barely change when we include child consumption or take-out.

These pronounced differences in the impact on the cost of the food basket across FAFH components translate into sharp differences in the impact on the moderate poverty line. When accounting for adult consumption, the increase in the cost of the food basket outweighs the fall in the expansion factor – Orshansky coefficient, resulting in an increase in the moderate poverty line. In contrast, when accounting for child consumption or take-out the cost of the food basket barely changes, and therefore that effect is outweighed by the fall in the expansion factor, resulting in a lower moderate poverty line. The fall in the poverty line is, nevertheless, modest because these FAFH components contribute very little in the overall household budget and therefore have a small impact on the expansion factor. Consequently, the poverty line effect is positive and substantial when introducing adult consumption, but negative and small when including either of the other two components.

Once again, the direction and relative magnitude of the effects also apply to the poverty gap and severity of poverty.

4.1.1.3. Overall effect. The overall effect results from adding the expenditure and poverty line effects. If they both go in the same direction, they reinforce each other and magnify the final impact on the poverty indexes. If they move in opposite directions, the net effect will depend on the difference between the two, and the magnitude of the overall effect will be smaller in absolute terms than either of the two effects individually.

In our case, the overall effect of including all components of FAFH on extreme poverty is always positive and significant. The poverty rate increases by 1.1 percentage points, or about 18 percent rise over the benchmark results. The increase on the poverty gap and severity of poverty is even more pronounced, changing by about 25 percent. Extreme poverty increases because the impact of a higher poverty line outweighs the impact of higher expenditures, and it is driven by adult FAFH.

By contrast, the overall effect of all FAFH components on moderate poverty is always negative and significant. The moderate poverty rate falls by almost 6 percentage points, or a 16 percent decrease over the benchmark. Similarly, the poverty gap and severity of poverty fall, by 20 and 22 percent, respectively. Contrary to the case of extreme poverty, it is now the expenditure effect that outweighs the poverty line effect.

A second difference relative to extreme poverty case is that now adult consumption does not explain virtually the totality of the change. When analyzing the expenditure and poverty line effects individually, the absolute magnitude of the effects is always stronger when including adult consumption relative to either of the other two components. However, taken together that is no longer the case. The reason behind is that the expenditure and poverty line effects move in opposite directions when we account for adult consumption. However, both effects move in the same direction when accounting for child consumption or take-out. Individually, each of the three components has a statistically significant impact on poverty and the three effects are of comparable magnitudes.

In sum, when looking at extreme (moderate) poverty, the inclusion of FAFH increases (decreases) the number of individuals who are poor, increases (decreases) the poverty gap among the poor, and increases (decreases) the severity of poverty among the poor. Furthermore, the impact of FAFH on the poverty gap and severity of poverty is more pronounced than the effect on poverty rates, especially for extreme poverty.[21]

[19] This may reflect a weakness in the questionnaire design to accurately collect this information. See Borlizzi and Cafiero (2014).

[20] Since poverty rates are calculated at the individual level, figures in Table 2 are at the individual level. An incidence of 90 percent means that 9 in 10 individuals live in households where at least one adult member eat outside during the reference period. Similarly, on average individuals live in households where 16 percent of the food budget is allocated to expenditure on FAFH by adults.

[21] Fig. 3 shows that these results are robust to the year selected. When we replicate poverty indexes for the period 2010–2013, we find a more or less parallel shift of the downward poverty trend that Peru experienced over the last few years. These results are consistent with the fairly stable trend in FAFH consumption since 2010 (Fig. 1).

Table 3
Impact of FAFH on the Gini coefficient Simulations including different FAFH components.

Place of consumption…	At home	At home + …			All
		Meals out		Takeout	
		Adults	Children		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Gini coefficient	38.46	37.28	38.28	38.45	37.14
	(0.48)	(0.44)	(0.47)	(0.47)	(0.44)
Effect		−1.18	−0.18	0.00	−1.32
		(0.65)	(0.67)	(0.67)	(0.65)

Notes: own calculations based on ENAHO 2010. Standard errors calculated taking into account survey design and sample weights. *Statistically significant at 5 percent level.

Table 4
Change in poverty status when including FAFH.

Extreme Poverty			
		Including FAFH	
		Poor	Non-poor
Only at-home meals	Poor	1,520,463	**393,285**
	Non-poor	**730,765**	26,979,752
Moderate Poverty			
		Including FAFH	
		Poor	Non-poor
Only at-home meals	Poor	8,748,740	**2,078,532**
	Non-poor	**353,034**	18,443,959

Notes: own calculations based on ENAHO 2010.

4.1.2. Consumption inequality

To measure the impact on consumption inequality in Table 3 we look at the Gini coefficient. We find that when FAFH is accounted for, the Gini coefficient falls from 38.5 to 37.1, a statistically significant change.[22] Once again, this reduction is mainly driven by adult FAFH consumption.[23]

4.2. Re-classification and poverty profile

When we account for FAFH, 41 percent of the population changes their relative ranking – measured by consumption decile. Moreover, the re-classification of individuals across poverty status is also substantial (Table 4). Among those classified as extreme poor when no FAFH is included, 21 percent (or close to 400,000 people) 'escape' poverty once we include FAFH. In addition, more than 730,000 individuals that were not poor are classified as poor with the inclusion of FAFH. The corresponding numbers for moderate poverty are also large: 19 percent (more than 2,000,000 individuals) and 350,000, respectively.

Does this re-classification affect the overall characterization of the poor population in any significant manner? To see this, we compare poverty profiles when FAFH is accounted or not. First, we compare demographic and socioeconomic characteristics between those groups that change poverty status when FAFH is included: those who leave versus those who fall into poverty. Then, we test whether the change in the composition of the poor population leads to a different poverty

[22] Bootstrapped standard errors are estimated taking into account the survey sample design and population weights (Bhattacharya, 2005, 2007).

[23] Fig. 4 presents inequality trends for the period 2010–2013. Proper account for FAFH shifts the trend downwards. Changes are significant at 5 percent in 2010–11, but not in 2012–13.

Table 5
Impact of FAFH on the profile of the extreme poor. Difference in means between those who are poor when FAFH is included (FAFH poor) relative to those who are poor when FAFH is excluded (at-home poor).

Sample…	Extreme poverty					
	If changed poverty status			All		
	Poor to non-poor	Non-poor to poor	Diff	At-home poor	FAFH poor	Diff
Household size & composition						
Household size	5.14	4.80	−0.34	5.01	4.92	−0.09*
Children < 15	0.75	0.77	0.02	0.74	0.75	0.01
Women 15–60	0.81	0.80	−0.01	0.79	0.79	0.00
Women 60+	0.23	0.31	0.08**	0.30	0.32	0.02
Men 15–60	0.85	0.69	−0.16***	0.75	0.71	−0.04***
Men 60+	0.23	0.28	0.05	0.25	0.26	0.01
Household's head characteristics						
Female	0.23	0.21	−0.02	0.22	0.22	−0.01
Single	0.04	0.04	−0.01	0.04	0.04	0.00
Indigenous	0.42	0.54	0.12***	0.49	0.52	0.03**
Illiterate	0.36	0.27	−0.09**	0.34	0.31	−0.03**
Primary incomplete	0.62	0.56	−0.06	0.63	0.61	−0.02*
Primary complete	0.19	0.23	0.04	0.20	0.21	0.01
Secondary incomplete	0.09	0.11	0.01	0.09	0.10	0.00
Secondary and above	0.09	0.10	0.01	0.07	0.08	0.01
Dwelling ownership						
Renting	0.03	0.01	−0.01	0.02	0.01	0.00
Owner	0.78	0.81	0.03	0.83	0.83	0.00
Other	0.20	0.18	−0.02	0.15	0.16	0.00
Access to facilities						
Running water	0.38	0.37	−0.01	0.34	0.34	0.00
Bathroom	0.37	0.46	0.10**	0.39	0.42	0.03**
Sewage connection	0.11	0.12	0.01	0.10	0.10	0.01
Electricity	0.56	0.58	0.03	0.46	0.49	0.02**
Phone	0.40	0.36	−0.04	0.27	0.27	0.01
Geographic region						
Urban coast	0.07	0.05	−0.02	0.04	0.04	0.00
Rural coast	0.05	0.02	−0.03**	0.04	0.03	−0.01**
Urban sierra	0.05	0.07	0.02	0.05	0.06	0.00
Rural sierra	0.61	0.64	0.04	0.67	0.67	0.00
Urban selva	0.04	0.05	0.01	0.03	0.04	0.00
Rural selva	0.15	0.11	−0.04	0.15	0.13	−0.01**
Metropolitan lima	0.04	0.07	0.03	0.02	0.03	0.01
Labor market outcomes						
Log per-capita income	5.39	4.75	−0.64***	4.74	4.63	−0.11***
# Individuals employed	2.88	2.18	−0.71***	2.39	2.23	−0.15***
# Females employed	1.20	1.06	−0.14	1.08	1.05	−0.03
# Males employed	1.69	1.11	−0.57***	1.30	1.18	−0.13***
# Employers	0.06	0.06	0.00	0.04	0.05	0.00
# Females employers	0.01	0.01	0.00	0.01	0.01	0.00
# Males employers	0.04	0.04	0.00	0.04	0.04	0.00
# Employees	1.55	0.44	−1.12***	0.75	0.51	−0.24***
# Females employees	0.45	0.14	−0.31***	0.21	0.15	−0.06***
# Males employees	1.11	0.30	−0.81***	0.54	0.36	−0.18***
# Self-employed	1.15	1.10	−0.05	1.14	1.13	−0.02
# Females	0.37	0.38	0.00	0.37	0.37	0.00

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Table 5 *(continued)*

Sample…	Extreme poverty					
	If changed poverty status			All		
	Poor to non-poor	Non-poor to poor	Diff	At-home poor	FAFH poor	Diff
self-employed # Males self-employed	0.78	0.72	−0.06	0.78	0.76	−0.02
Observations	296	587	883	1505	1796	3301

Source: ENAHO 2010.
Notes: all statistics at the household level, population-weighted means; test of difference in means accounts for sampling design.
***,**,* Statistically significant at 1, 5, and 10 percent levels, respectively.

profile by comparing average characteristics of the entire poor population for the two scenarios. All differences are calculated going from the 'FAFH poor' – i.e. poor when FAFH is included, to the 'at-home poor' – i.e. poor when it is excluded, and therefore reflect the fact that the former group eats relatively more at home than the latter. Results are shown in Table 5 for extreme poverty and Table 6 for moderate poverty.

Overall, we find that the two population groups that change poverty status have different average characteristics. These differences also remain statistically significant, though smaller in size, when we compare the overall poor populations under each scenario. While the magnitude of the changes is generally small, they are consistent with expected correlates with eating out, especially terms of household composition and labor market characteristics.

Looking first at demographic characteristics among the extreme poor, the 'FAFH poor' have a different household structure – smaller households with fewer prime-age males; the household head is more likely to be indigenous and is less likely to be illiterate or have primary incomplete. There are no statistically significant differences in the distribution of dwelling ownership, though there are a few in access to services: the 'FAFH poor' are more likely to have electricity and a bathroom. In terms of geographic location, once FAFH is included there are fewer poor households in rural areas. Finally, marked differences arise when looking at labor market outcomes. Results are consistent with those households that are extremely poor when FAFH is accounted for – but not otherwise – having lower income per capita and fewer members employed, in particular males. Differentiating across types of employment, it is fewer employees, as opposed to self-employed or employers, what drives the results. Overall, the findings suggest that households with more prime-age adults and working members are more likely to consume FAFH and therefore more likely to be classified as extreme poor if those resources are not properly accounted for.

The difference in the profile of the moderate poor is more pronounced, with almost all characteristics being different across the two scenarios. In terms of household structure, the 'FAFH poor' have larger households with more dependents, and fewer prime-age males. In addition, household heads are more likely to be indigenous and have lower education. In contrast with extreme poverty, ownership status is also different: the 'FAFH poor' are more likely to be owners. They are also less likely to have access to services such as water, sewage, or electricity. Moreover, there are statistically significant differences in the geographic distribution of the poor. Finally, consistent with increasing consumption of FAFH as resources increase, 'FAFH poor' households have fewer members employed and lower income per capita.

Table 6
Impact of FAFH on the profile of the moderate poor. Difference in means between those who are poor when FAFH is included (FAFH poor) relative to those who are poor when FAFH is excluded (at-home poor).

Sample…	Moderate poverty					
	If changed poverty status			all		
	Poor to non-poor	non-poor to poor	Diff	At-home poor	FAFH poor	Diff
Household size & composition						
Household size	4.38	3.75	−0.63***	4.78	4.83	0.05**
Children < 15	0.68	0.67	0.00	0.76	0.77	0.02***
Women 15–60	0.80	0.73	−0.07*	0.83	0.84	0.00
Women 60+	0.18	0.33	0.15***	0.25	0.27	0.02***
Men 15–60	0.85	0.73	−0.12***	0.80	0.78	−0.02***
Men 60+	0.20	0.24	0.04	0.23	0.23	0.01**
Household's head characteristics						
Female	0.24	0.24	0.00	0.22	0.22	0.00
Single	0.06	0.05	−0.01	0.04	0.04	0.00**
Indigenous	0.32	0.36	0.04	0.39	0.41	0.02***
Illiterate	0.13	0.14	0.01	0.18	0.20	0.01***
Primary incomplete	0.32	0.37	0.05	0.43	0.45	0.02***
Primary complete	0.21	0.19	−0.02	0.21	0.21	0.00
Secondary incomplete	0.17	0.13	−0.04	0.15	0.14	−0.01**
Secondary and above	0.30	0.31	0.01	0.21	0.20	−0.02***
Dwelling ownership						
Renting	0.09	0.08	−0.01	0.05	0.04	−0.01***
Owner	0.64	0.70	0.06	0.73	0.74	0.02***
Other	0.27	0.21	−0.05	0.23	0.22	−0.01***
Access to facilities						
Running water	0.65	0.65	0.01	0.54	0.52	−0.02***
Bathroom	0.66	0.69	0.04	0.58	0.56	−0.01***
Sewage connection	0.52	0.46	−0.06	0.35	0.31	−0.04***
Electricity	0.86	0.80	−0.06**	0.73	0.70	−0.03***
Phone	0.71	0.66	−0.05	0.56	0.52	−0.03***
Geographic region						
Urban coast	0.16	0.29	0.14***	0.14	0.14	0.00
Rural coast	0.05	0.00	−0.05***	0.04	0.04	0.00***
Urban sierra	0.17	0.06	−0.11***	0.13	0.11	−0.01***
Rural sierra	0.17	0.39	0.22***	0.36	0.41	0.05***
Urban selva	0.10	0.00	−0.10***	0.07	0.06	−0.01***
Rural selva	0.08	0.03	−0.05***	0.09	0.09	0.00
Metropolitan lima	0.27	0.23	−0.04	0.17	0.15	−0.02***
Labor market outcomes						
Log per-capita income	5.89	5.45	−0.44***	5.29	5.14	−0.14***
# Individuals employed	2.50	1.84	−0.66***	2.34	2.27	−0.07***
# Females employed	1.07	0.85	−0.23***	1.06	1.04	−0.01*
# Males employed	1.43	0.99	−0.43***	1.28	1.23	−0.05***
# Employers	0.11	0.10	−0.01	0.08	0.07	−0.01**
# Females employers	0.04	0.03	−0.01	0.02	0.02	0.00**
# Males employers	0.07	0.07	0.00	0.06	0.06	0.00
# Employees	1.28	0.48	−0.80***	0.89	0.77	−0.12***
# Females employees	0.45	0.14	−0.31***	0.29	0.24	−0.05***
# Males employees	0.83	0.34	−0.49***	0.60	0.53	−0.07***
# Self-employed	1.04	1.04	0.00	1.09	1.09	0.01
# Females	0.46	0.43	−0.03	0.43	0.43	−0.01

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Table 6 *(continued)*

Sample…	Moderate poverty					
	If changed poverty status			all		
	Poor to non-poor	non-poor to poor	Diff	At-home poor	FAFH poor	Diff
self-employed # Males self-employed	0.58	0.61	0.03	0.65	0.67	0.02***
Observations	1445	284	1729	7533	6372	13,905

Source: ENAHO 2010.
Notes: all statistics at the household level, population-weighted means; test of difference in means accounts for the sampling design.
***,**,* Statistically significant at 1, 5, and 10 percent levels, respectively.

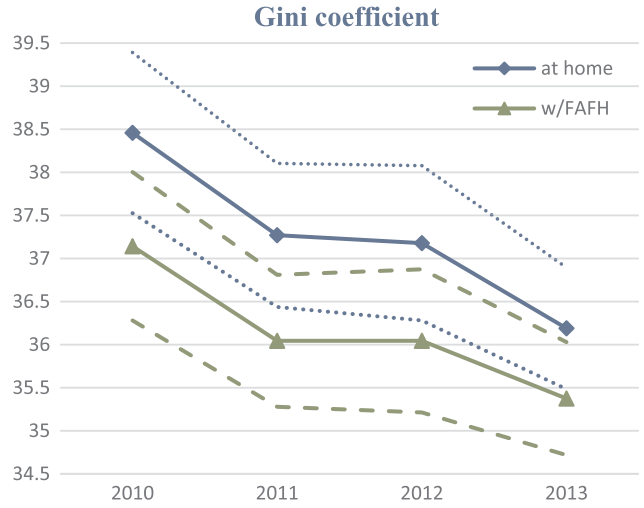

Fig. 4. Impact of FAFH on Consumption Inequality, Peru 2010–2013 Gini coefficient. Notes: own calculations based on ENAHO 2010–2013. Dashed and dotted lines indicate the 95% confidence intervals.

5. Conclusion

Food consumption away from home is rapidly growing across the developing world, yet Household Consumption and Expenditure Surveys are failing to properly account for these changes in consumption patterns. This is likely to have significant consequences for welfare analysis, since the measurement of food consumption is critical for poverty, food security, health, and nutrition analyses, among others.

In this paper we study the potential impact that excluding FAFH consumption may have on poverty and consumption inequality. We first show that conceptually, the direction of the change on poverty and inequality cannot be established ex ante. Then, we take advantage of the rich data on FAFH collected by the National Household Survey in Peru to provide evidence on the direction and magnitude of the change for Peru by simulating the scenario where no FAFH is accounted for. Peru is a relevant context for this analysis, as FAFH has been growing over the last decade to reach about 27 percent of the food budget.

We find that the effect on poverty and inequality indices is substantial in magnitude and statistically significant. The extreme poverty rate *increases* by 18 percent while the moderate poverty rate *falls* by 16 percent once FAFH is included. The impact on the poverty gap and severity of poverty has a similar direction and is in general larger. In terms of inequality, accounting for FAFH reduces the Gini coefficient by 3.4 percent, a statistically significant reduction.

Finally, we explore whether these effects change our general understanding of who the poor are. We confirm that by accounting for FAFH poverty profiles differ due to the fact that individuals move along the consumption distribution. While the magnitude of the changes is generally small in this setting, they are consistent with expected correlates of eating out, and therefore raise concerns over the possible implications to other settings.

The collection of FAFH data in national household surveys poses a number of challenges. For example, respondents do not know the ingredients used in the meals and therefore can only vaguely specify the content of what they consume, meal sizes vary widely and cannot be measured in standard units, complicating the accurate report of quantities. Moreover, household informants are unlikely to know precisely the consumption of all other household members. Additionally, even with adequate data on household or individual consumption, the measurement of FAFH usually also requires some information from the supply-side. While this is most relevant for nutrition and health analyses, it is also important for poverty analysis since calories are used in the construction of the poverty line.

Due to these challenges, new methodological research is needed to identify best practices in the collection of FAFH data. Yet, some potential directions to improve data collection for poverty and inequality analysis seem relevant. First, adding a module on FAFH seems to be a first order priority. To simplify reporting, information could be asked by meal events (with the events tailored to the context); snacks (and possibly alcoholic beverages) should be explicitly taken into account; the module could differentiate across places of consumption, especially across those expected to have different calorie prices and nutritional composition. Addressing the respondent challenge is harder. Whenever possible, such as when surveys already have an individual-level module, information should be reported by each adult respondent. If this proves impossible and information needs to be reported by a household informant, careful thought should be put into the selection of the appropriate person. Finally, household level reports could be complemented with additional information to estimate calorie costs. In all, more work is needed to further test some of these ideas.

In all, our findings suggest that ignoring this increasingly important component of food consumption in household surveys can seriously affect welfare measures and our general understanding of who the poor are. Given that the direction of the effect is unknown ex ante, accounting for FAFH is even more important. Furthermore, as the prevalence and importance of FAFH is expected to increase as economies grow, the measurement of FAFH in national household surveys becomes an urgent issue or overtime comparisons will become less and less meaningful over time. Future research should aim to expand and validate these findings in other settings, and deepen the analysis through methodological research aiming to identify how best to collect this information in household surveys.

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