Online Supporting Materials for Kraft et al.

Supplemental Methods

Study populations

Tsimane

Tsimane are indigenous forager-horticulturalists residing along the Maniqui, Quiquibey, and Mato Rivers in the Beni Department of rural lowland Bolivia. Roughly 16,000 Tsimane (1) inhabit >90 villages, with a population growth rate of ~3.9% (2) due to natural fertility schedules (total fertility rate=9 births per woman) and declining child and adult mortality rates (3). Unlike many other indigenous groups in Bolivia, Tsimane remained relatively isolated from broader Bolivian society during most of the 20th century due to their relatively inaccessible territory lacking commercial resources (gold, oil, rubber), language barriers, and cultural differences. Since the 1970's, roads, economic activities (i.e. logging), and development projects have brought rapid changes in market integration and technology, although <5% of Tsimane villages currently have electricity, and there is no running water or sanitation systems. Access to markets decreases along a gradient extending from the nearest market town (San Borja, pop. ~25,000) to remote riverine and interior forest villages, though itinerant merchants have sporadically delivered limited market goods throughout the territory. In one notable exception, an upriver village (Misión Fatima) containing a Catholic mission since the 1950's is relatively acculturated for its remote location (including a small airstrip).

Tsimane subsistence involves a combination of hunting, fishing, gathering (wild fruits and honey), and swidden horticulture (primarily plantain, rice, manioc and corn). Unlike plantains and rice, which were introduced to South America by European colonists, manioc and corn are agricultural staples that originated in the New World (4). Nevertheless, all of the high-starch staples currently grown by Tsimane have likely contributed significantly to the diet for hundreds of years. Some portion of gathered foods and cultigens are traded or sold in the San Borja or other nearby small markets, permitting access to market goods. Access to market foods is further increased by men's itinerant wage-labor. Given the availability of staples produced by foraging and horticulture, market foods consumed by Tsimane are almost exclusively processed or packaged foods (e.g. pasta, candy) or food additives and cooking staples (e.g. lard, oil, salt, sugar, hereafter "LOSS"). Less than 5% of families own cattle and Tsimane do not process milk for consumption.

Moseten

Moseten are a neighboring population of the Tsimane, occupying the southern and northern reaches of Tsimane territory (Supplemental Figure 1). Moseten share many socio-ecological features and cultural practices with Tsimane, and together they comprise a language family isolate in Bolivia. However, the two groups differ in their histories of acculturation. Given their location in the La Paz Department, the Moseten have greater access to roads, vehicles, electricity and public health infrastructure, education, and market goods than Tsimane. Whereas Tsimane prefer to speak their native language, Moseten converse predominantly in Spanish. In addition, Moseten are more politically enfranchised than Tsimane, maintaining official rights to their territory and actively benefiting from external economic operations (i.e. logging, cacao production) that occur in their territory.

Data cleaning and processing

Due to the inherent issues associated with dietary recall data collected during interviews, data were subjected to a series of cleaning procedures prior to analysis. The goal of the cleaning procedures was to convert reported amounts of all food items to units of kilograms, which could then be converted into energy and nutrient profiles via matching with our nutritional tables. The procedures were sequential in order to preserve the most detailed information available while also ensuring the most complete use of our data. In order of first to last, the procedures included:

1) Amounts reported in units of weight (grams, pounds, etc.) were converted to kilograms by standard conversions.
2) Liquids reported in units of volume were converted to weights (kg) via known densities (e.g. for *chicha*).
3) Items reported as whole units (*unidades)* were converted to weights by multiplying the number of units by average measured weight values (e.g. mean kilograms per plantain). Unit weight values were obtained in the field for most items, via hand-held scales, and in missing cases were assigned based on similar foods (fish species of similar size). Because unit-based reports were likely to include whole or unprocessed items, converted weights were then adjusted using estimates of edibility based on direct measurements of consumed vs. non-consumed portions or previous studies (5).
4) Some foods were also reported in local units. Examples include bunches (*pengas*) of plantain or gourd bowls (*tutumas*) of chicha. In such cases, we used average field measurements (based on repeated weighing of individual units) to convert local units to weight in kilograms.

5) Food amounts were sometimes reported based on the number of plates (*platos*) consumed. To use this information, we calculated median plate size (in weight) for specific food items by isolating cases where the total amount prepared for a meal, the total number of people eating, and the number of plates consumed were available. Median plate size was then estimated across all observations by dividing the total amount consumed by the number of people eating, and dividing that amount by the number of plates. In this way we obtained measurements in kilograms for units such as “rice-plates”.
6) For foods missing direct estimates of personal consumption but including information on total amounts prepared, we assumed that all adults consumed the same amount at a meal and divided the total amount prepared by the number of individuals. Appropriate conversions in the previous steps were employed depending on the units reported for total amounts prepared.
7) Finally, a minority of observations from our Moseten data (12.4%) included food items for which subjects were unable to recall an amount consumed or prepared. For these cases we assigned an average amount consumed for that food item using all other instances where that food was observed.

24-hour dietary recall

Elicitation of quantities consumed was facilitated through the use of visual aids of known volume or weight. Estimated units of quantities consumed varied by food type (e.g. gourd bowls of *chicha* [homemade fermented beer made from cultigens], kilograms of meat, individual pieces of fish). Subjects were asked about the number of other individuals that shared a meal; these food sharing data were used to estimate a participant’s own consumption of cooked foods (e.g.

fish stew) that are commonly shared within or across households (see above for additional details regarding data cleaning and processing).

Nutritional estimates

In order to convert self-reported dietary intake into nutritional estimates of energy and macro- and micro-nutrients, we compiled nutritional estimates for individual food items using publicly available databases. We used local or regional nutrition databases (*Tabla Alimento Boliviano*, *Tablas Peruanas de Composicion de Alimentos*, *Tabla de Alimentos Brasilien*, *Tabla de Composicion de Alimentos de Centroamerica*, among others listed at 'http://www.fao.org/infoods/infoods/tables-and-databases/latin-america/en/'), as well as the USDA Food Composition Database (https://ndb.nal.usda.gov/ndb/), Harvard School of Public Health Food Composition Tables (https://regepi.bwh.harvard.edu/health/nutrition.html), or direct estimates for specific foods in the scientific literature. Where several estimates were available for a single food item, values were either drawn from the most local source (i.e. *Tabla Alimento Boliviano*) or averaged across sources. Rare animal or fish species for which specific estimates were unavailable were assigned average values across wild game (of a given size class) or local fish, respectively. Values for cooked food items were generally used when available unless a food item was known to be consumed raw (e.g. fruit). Finally, in the case of *chicha*, a prominent food for which nutritional estimates were unavailable, samples were collected at different stages of fermentation and analyzed directly (Midwest Laboratories, Omaha NE).

In a small number of cases (<2% of consumption events) no information was available on amounts consumed, and these were excluded from analyses.

Comparison with time allocation-based estimates of diet

Previous estimates of macronutrient intake in the Tsimane diet were derived from systematic behavioral sampling (6). In brief, this “time allocation” method estimated male and female total energy expenditure (TEE) using published equations based on anthropometrics, and then assigned macronutrient intake from different food items in proportion to observations of consumption events from systematic behavioral observation. This method thus assumes that a person consumed relative amounts of a particular food in direct proportion to the frequency of observations that she was observed consuming that food. For example, if 10% of all observations of men eating were of rice consumption, then 10% of TEE would be ascribed to rice.

For this paper, TEE estimates for adults were updated with more recent measurements using the doubly labeled water method (Supplemental Table 2). In addition, behavioral samples used in this analysis were collected between 2002-2005, which is 5-10 years prior to data collection for 24-hour recall data. Given that our 24-hour recall data indicate that diet is not static over time, we used coefficients from linear mixed effects models and an average time difference of 5 years to transform previous estimates of carbohydrate intake (fat and protein did not show changes over time). Energy intake did not need to be scaled because doubly labeled water measures were taken more recently (2016).

Limitations of 24-hour recall

Data based on 24-hour dietary recall is not without drawbacks. Indeed, the use of dietary recall data has been criticized, with some authors arguing that results are highly variable and unreliable (7). Validation using the gold standard doubly-labeled water method often leads to conflicting results, although measures may be fairly reliable for generating group-level estimates

(8) and repeated observations can improve accuracy at the individual level (9). In particular, it is thought that subjects, especially those who are overweight or have unhealthy diets, tend to under-report food consumption events and therefore total caloric and nutrient intakes (10). The extent to which such criticisms apply to small-scale societies that lack social stigmas against overeating or are unlikely to hold idealized concepts of nutritionally acceptable diet, however, remains unknown. General difficulties related to assessment of approximate amounts of consumed foods suggests caution in interpretation, particularly at the individual level, and thus we focus primarily on population-level differences (or those across age/sex classes).

Several alternative techniques have been proposed for improving estimates of dietary intake, some of which could be relevant to studies of subsistence populations going forward. These include providing subjects with low-cost smartphones and uploading photos of consumption events to a central server (11) or using wrist-based accelerometry to capture hand-to-mouth movements (12,13).

National Health And Nutrition Examination Survey

NHANES 2013-14 data (n = 8,531 individuals) were downloaded from the public repository at https://wwwn.cdc.gov/nchs/nhanes/Search/DataPage.aspx?Component=Dietary&CycleBeginYear=2013. Although NHANES dietary recall data are collected using a multi-pass strategy, we limited our analysis to data collected during the first 24-hr recall period because we are interested in population mean estimates and this strategy facilitated maximum comparability with our Bolivian data. NHANES data were filtered to include only those meeting the NHANES standard of “reliable and met the minimum criteria.” To accommodate the stratified sampling (multi-stage, unequal probability of selection) design used by the NHANES, we used the *survey* (14) package in R to incorporate appropriate sampling weights into the calculation of summary statistics. Weights account for demographic proportions and uneven sampling between weekdays and weekends.

Dietary diversity scores

First, we calculated a Food Variety Score (FVS) by summing all unique food items consumed by an individual based on the 24-hour recall (15). Second, an individual dietary diversity score (IDDS; based on the Women’s Dietary Diversity Score) was calculated for each person-day following methods proposed by the Food and Agriculture Organization (FAO) of the United Nations (16). The IDDS was designed to assess general nutritional adequacy of an individual’s dietary intake. Specifically, the IDDS was calculated by separating individual foods into nine WHO categories, and then summing the number of categories consumed per person-day: (1) starchy staples, (2) dark green leafy vegetables, (3) other vitamin A rich fruits and vegetables, (4) other fruits and vegetables, (5) organ meat, (6) meat and fish, (7) eggs, (8) legumes, nuts, and seeds, (9) milk and milk products. Values of IDDS thus range from 0-9. For more information on how specific food items were partitioned into categories see (16).

Finally, we generated a measure of dietary diversity (Shannon’s H) that takes into account the number of different food groups consumed *and* their relative amounts. The FVS and IDDS, in contrast, only take into account the number of different foods, regardless of how much was consumed. Shannon’s H, or the Shannon-Weiner Index (H) is calculated as:

$$H = -\sum_{i=1}^{s} p_i \ln(p_i)$$

Where s is the number of food groups consumed and p_i is the proportion of total calories consumed on that day from food group i. Shannon's H could be calculated from any number of food category groupings, but here we use the WHO categories presented above for the IDDS.

Supplemental Tables

Supplemental Table 1: Physiological attributes relating to cardiovascular health in Tsimane (values for 705 adults (male and female) from Table S1 in Kaplan et al. (17)). Values indicate mean and SD.

BMI (kg/m2)	24.1±3.5
Body fat (%)	22.0±8.2
Systolic blood pressure (mm Hg)	115.9±12.5
Diastolic blood pressure (mm Hg)	73.3±9.9
Total cholesterol (mg/dl)	150.9±30.3
LDL-C (mg/dL)	91.2±27.5
HDL-C (mg/dL)	39.5±7.8
Triglycerides (mg/dL)	102.1±43.7
Glucose (mg/dL)	78.8±10.5
% Obese (BMI >30)	6
% Hypertensive	5

Supplemental Table 2: Study sample characteristics for Tsimane and Moseten.

	Tsimane	**Moseten**
n	2496	229
Age (mean ± SD)	53.8 ± 11.3	54.8 ± 10.7
% male	49%	52%

Supplemental Table 3: Tsimane dietary estimates based on 24-hour recall versus time allocation. The time allocation method used male and female estimates of total energy expenditure (TEE) from doubly labeled water as a measure of total energy consumption, and then assigned consumption of different food items in proportion to observations of consumption events from systematic behavioral observation.

Nutrient	**Units**	**Female**		**% Difference**	**Male**		**% Difference**
		Time allocation	**24-hr recall**		**Time allocation**	**24-hr recall**	
Energy	kcal	2186[a]	2376	8 %	3065[a]	2677	13%
Protein	g	97.7	117.84	21 %	119.7	137.43	15 %
Total lipid (fat)	g	43.8	38.5	12 %	49.5	44.4	10 %
Carbohydrate	g	421	370.52	12 %	606	413.37	32 %

[a]Energy intake for time allocation estimates are from doubly labeled water measurements (18).

Supplemental Table 4: Correlation between measures of LOSS consumption (reported amounts obtained in the last month versus amounts consumed). All variables were log+1 transformed to approximate normality.

	Tsimane			Moseten		
model	***r***	**df**	***P***	***r***	**df**	***p***
Sugar	0.90	965	<0.001	0.94	189	<0.001
Salt	0.94	765	<0.001	0.98	193	<0.001
Oil	0.61	836	<0.001	0.59	189	<0.001
Lard	0.92	677	<0.001	0.62	193	<0.001

Supplemental Table 5: Tsimane food table. Average daily caloric consumption indicates the mean number of kcal that Tsimane consume of a specific resource per day. Within each food type, foods are listed in descending order of kcal consumed per day. This list is not exhaustive, and some other minor food species (e.g. wild fruits) have been documented in the Tsimane diet.

	English/Spanish Name	Tsimane	Latin name	Average daily caloric consumption (kcal)
Cultivated staple				
	Green plantain	pere	*Musa sp.*	892.4
	Rice	arrosh	*Oryza sativa*	301.8
	Manioc (chicha)	shoc'dye o'yi	*Manihot esculenta*	137.2
	Manioc	o'yi	*Manihot esculenta*	85.7
	Corn (chicha)	shoc'dye	*Zea mays*	77.9
	Plantain (chicha)	shoc'dye pere	*Musa sp.*	74.5
	Maize	tara	*Zea mays*	5
	Manioc + maize (chicha)		*Manihot esculenta + Zea mays*	1
	Manioc + plantain (chicha)		*Musa sp. + Manihot esculenta*	< 1
	Onion	cebolla	*Allium cepa*	< 1
	Sweet potato	ca'in	*Ipomea batatas*	< 1
	Rice (chicha)		*Zea mays*	< 1
Domestic meat/dairy				
	Beef (dried, cured)		*Bos taurus*	96
	Poultry		*Gallus gallus*	40.5
	Beef		*Bos taurus*	25.7
	Pork		*Sus scrofa*	24.7
	Organ meat		*various species*	3.2
	Egg		*Gallus gallus*	2.8
	Chorizo (pork sausage)		*Sus scrofa*	2.2
	Pork skin		*Sus scrofa*	1.3
	Milk		*Bos taurus*	<1
Wild game				

Collared peccary	quiti'	*Tayassu tajacu*	38.4
Paca	naca'	*Agouti paca*	20.1
South American Coati	chu'	*Nasua nasua*	16.3
Gray brocket deer	ñej	*Mazama gouazoubira*	14.5
white-lipped peccary	mumujni	*Tayassu pecari*	8.7
Brazilian tapir	shi'	*Tapirus terrestris*	8.2
Howler monkey	uru'	*Alouatta seniculus*	7.4
Brown capuchin monkey	oyoj	*Cebus apella*	4.9
Seven banded long-nosed armadillo	väsh	*Dasypus septemcintus*	4.8
Southern tamandua (anteater)	o'oyo	*Tamandua tetradactyla*	3.5
jungle fowl	emej	*Family: Cracidae (Penélope jacquacu*)*	3.3
brown agouti	shätij	*Dasyprocta variegata*	3.1
spider monkey	odo'	*Ateles paniscus*	2.8
Kinkajou	voyo'	*Potos flavus*	2.7
Waterfowl (duck)			2.5
Capybara	oto'	*Hydrochaeris hydrochaeris*	2
Night monkey	isbara'	*Aotus sp.*	1.7
Giant anteater	yusi'	*Myrmecophaga tridactyla*	1.5
Rock pigeon/Dove		*Columba livia*	1.5
tortoise	quijbo	*Geochelone carbonaria*	1.3
tinamou	fofor	*Tinamous major*	1.1
Giant armadillo	shajbe	*Priodontes maximus*	< 1
Brazilian porcupine	tsotsoj	*Coendou prehensilis*	< 1
parrot/loro chulo			< 1
Arrau sideneck turtle	meme'	*Podocnmis spp.*	< 1
Common squirrel monkey	chichi'	*Saimiri boliviensis*	< 1
unidentified fowl	tyiviya		< 1
Hoffmann's two-toed sloth	urube	*Choloepus hoffmani*	< 1

	White-tailed deer	bachona	*Odocoileus virginianus*	< 1
Cultivated fruit				
	Mango	manga	*Mangifera indica*	9
	Sugar cane	wiroj	*Saccharum officinar*	5.4
	Orange	maraca	*Citrus sinensis*	3.7
	Lime	limona'ra	*Citrus sp.*	2.7
	Watermelon	shandia	*Citrullus lanatus*	1.7
	Grapefruit	toronja	*Citrus grandis*	1.4
	Papaya	poofi	*Carica papaya*	< 1
	Banana	dyineya	*Musa sp.*	< 1
	Pineapple	merique	*Ananas comosus*	< 1
	Mandarina		*Citrus reticulata*	< 1
	Lemon		*Citrus limon*	< 1
	Tomato	tomate	*Lycopersicon esculentum*	< 1
Wild fruit/legumes				
	Palm fruit	mana'i	*Attalea phalerata C. Martius ex Sprengel*	5
	chocolatillo	veya	*Duguetia spixiana*	3.4
		pimi	*Pseudolmedia macrophilla Trecul.*	2.2
	Pataua palm fruit	jajru	*Jessenia bataua*	2
	Sour bacuri	tsocoi	*Garcinia acuminata (ant. Rheedia acuminata)*	1.1
	Buriti palm fruit	tyu tyura'	*Mauritia flexuosa/Mauritia vinifera*	1
	Peanut	dyabaj	*Arachis hypogaea*	< 1
	Heart of palm	vä'ij	*Bactris gasipaes*	< 1
	Cacao	chocorate	*Theobroma cacao L.*	< 1
	Ice cream bean	cu'na'	*Inga crestediona*	< 1
	berry (non-specific)		*Morus sp.*	< 1
	Avocado	parta	*Persea americana*	< 1
	Beans	corishij	*Phaseolus vulgaris*	< 1
	Achacha	ibiji/bu'lle	*Garcinia humilis (ant. Rheedia sp.)*	< 1
Honey				

honey	corojma	*Apis mellifera*	< 1

Fish

Sabalo	vonej	*Prochilodus nigricans*	154.8
Benton	sherej shere	*Hoplias malabaricus*	45.4
sabalina	bojmo	*Curimatella meyeri*	32
Surubi	sona're	*Pseudoplatystoma fasciatum*	25.5
	shicurity	*Hemisorubim platyrhynchus*	15.4
Tachaca	tavava/vutich	*Pseudodoras niger or Pterodoras granulosus*	15
boga	tomsis	*Leporinus friderici*	12.6
yayu	pu'na	*Erythrinus erythrinus or Hoplerythrinus sp.*	10.7
Blanquillo	pincusushi	*Pimelodina flavipinis*	10.5
Bagre	jutiru	*Pimelodus sp.*	8.6
Buchere	sisij	*Hoplosternum littorale*	7
Sardina	siyasiya	*Triportheus sp.*	6.7
Toro	cavadye'	*Leiarius sp.*	6.5
Paleta	paquisaye	*Surubimichthys planiceps*	5.7
Palometa	copinety	*Serrasalmus cf. natleri*	4.7
Sardina	cum	*Astyanax bimaculatus*	4.6
piranha	irimo'	*Serrasalmus sp.*	4.6
Zapato	va'tse	*Lituratus disjunctivus*	4.1
Golden dorado	cajsare'	*Salminus maxillosus/Brachyplatystoma sp/Pellona flavippinnis*	3.3
Boca ancho	Saca'vadye	*Agenliosus sp.*	3
	bonoja	*Potamorhina altamazonica*	2.8
Pacusillo	tobiri	*Schizodon fasciatum*	2.1
carancho	co'ro	*Pterygoplychthys sp.*	2
Palometa real	serepapa	*Astronotus cf. ocellatus*	1.3
Simbadito	tsitsi	*Callichthys callichthys*	1.3
	nivibi	*Gymnotus carapo*	
Peacock bass	tucunare'	*Cichla ocellaris*	< 1
Bagre pintado	shivajnarety	*Leiarius marmoratus*	< 1
	mo'ijva		< 1
	énojno		< 1
Awowo	Anguila	*Gymnotus sp.*	< 1
	bona chica		< 1
Matrincha	Jatuarana	*Brycon cf. cephalus*	< 1
	shiare'	*Charax gibbosus*	< 1

	General	ivijjnadye'	*Phractocephalus hemiliopterus*	< 1
		dujra		< 1
	Cachorro	Nabatdye	*Raphiodon vulpinus*	< 1
		romova	*Acestrohynchus sp.*	< 1
		sui'tyi'	*Eigenmannia virescens or Sternopygus macrurus*	< 1
	Pez Perro			< 1
	Canned tuna in oil			< 1
Market, other				
	Sugar			22.8
	Coffee			1.2
	Soda (coca cola)			1.1
	cookies			< 1
	ceibo (alcohol)			< 1
	powdered sugary drink (prepared)			< 1
	Beer			< 1
	Ice pop			< 1
Market staple				
	Pasta			116.6
	Wheat flour			35.6
	Bread			25.6
	Lentil			1
	Powdered milk			< 1
	Oatmeal			< 1
	Fried dough (flour)			< 1
	Cheese			< 1
	Hominy soup			< 1

Supplemental Table 6: Moseten food table. Some foods which are commonly consumed by younger Moseten today, such as soda, may be missing from 24-hour recalls due to omission bias or the focus on older individuals.

	English/Spanish Name	Moseten	Latin name	Average daily caloric consumption (kcal)
Cultivated staple				
	Green plantain	pere	*Musa sp.*	294
	Rice	arrosh	*Oryza sativa*	237
	Manioc (chicha)	shoc'dye o'yi	*Manihot esculenta*	31.4
	Manioc	o'yi	*Manihot esculenta*	136.2
	Manioc + plantain (chicha)		*Musa sp.* + *Manihot esculenta*	< 1
	Onion	cebolla	*Allium cepa*	8.5
	Rice (chicha)		*Zea mays*	< 1
	Potato		*Solanum tuberosum*	28.7
	Squash		*shobo*	<1
Domestic meat/dairy				
	Chicken		*Gallus gallus*	245.3
	Beef		*Bos taurus*	162.8
	Egg		*Gallus gallus*	16.3
	Pork		*Sus scrofa*	13
	Llama meat		*Lama glama*	6.2
	Milk		*Bos taurus*	3
	Beef (dried, cured)		*Bos taurus*	2.6
	Chorizo (pork sausage)		*Sus scrofa*	2.2
Wild game				
	Paca	naca'	*Agouti paca*	24.8
	Waterfowl (duck)			16
	Collared peccary	quiti'	*Tayassu tajacu*	10.9

	white-lipped peccary	mumujni	*Tayassu pecari*	9.6
	South American Coati	chu'	*Nasua nasua*	7
	Seven banded long-nosed armadillo	väsh	*Dasypus septemcintus*	1.2
	White-tailed deer	bachona	*Odocoileus virginianus*	< 1
Cultivated fruit				
	Orange Juice	maraca	*Citrus sinensis*	9.9
	Orange	maraca	*Citrus sinensis*	45.9
	Cacao	chocorate	*Theobroma cacao L.*	20
	Banana	dyineya	*Musa sp.*	19.6
	Papaya	poofi	*Carica papaya*	15.3
	Mango	manga	*Mangifera indica*	12.5
	Mandarina		*Citrus reticulata*	7.3
	Grapefruit	toronja	*Citrus grandis*	3.6
	Watermelon	shandia	*Citrullus lanatus*	2.1
	Tomato	tomate	*Lycopersicon esculentum*	1.6
	Pineapple	merique	*Ananas comosus*	1.5
	Sugar cane	wiroj	*Saccharum officinar*	< 1
	Grapefruit	uva		< 1
	Chili pepper	locoto		< 1
Wild fruit/legumes				
	Coconut		*Cocos nucifera*	7.7
	Huaso		*Leonia racemosa C. Martius*	4.2
	Beans	corishij	*Phaseolus vulgaris*	2.6
	Achacha	ibiji/bu'lle	*Garcinia humilis (ant. Rheedia sp.)*	2.4
	Ice cream bean	cu'na'	*Inga crestediona*	1.5
	Avocado	parta	*Persea americana*	< 1
	Peanut	dyabaj	*Arachis hypogaea*	< 1
Fish				

	Sabalo	vonej	*Prochilodus nigricans*	44.6
	Amere	amere darsi'	*Hypophthalmus edentatus*	11.4
	Sardina	siyasiya	*Triportheus sp.*	9.3
	Toro	cavadye'	*Leiarius sp.*	6.5
	sabalina	bojmo	*Curimatella meyeri*	6.5
	Canned tuna in oil			4.9
	Surubi	sona're	*Pseudoplatystoma fasciatum*	4.7
	Miscellaneous fish			4
	carancho	co'ro	*Pterygoplychthys sp.*	1.4
	Tachaca	tavava/vutich	*Pseudodoras niger or Pterodoras granulosus*	1.2
	Benton	sherej shere	*Hoplias malabaricus*	< 1
Market, other				
	Sugar			19.6
	Cake (paneton)			5.4
	Coffee (w/ sugar)			3.7
	Cookies			3.1
	Tea (w/ sugar)			2.7
	powdered sugary drink (prepared)			2.7
	Coffee w/ milk			1
	Soda (coca cola)			< 1
	Mate			< 1
	Spam (viandada)			< 1
Market staple				
	Bread			161.6
	Pasta			99.6
	Sopa de trigo			24.2
	Quinoa			7.2

Cheese	4
Empanada	4
Sopa de mani	3.7
Fried dough (flour)	3.5
Lentil	3.5
Oatmeal	3.3
Salad	2.7
Pea	2.6
Oatmeal w/ milk	1.5
Sopa de chuno	1.3

Supplemental Table 7: Spearman correlation coefficients for within-individual variation in reported LOSS consumption.

	Tsimane		Moseten	
model	***rho***	***p***	***rho***	***p***
Sugar-Oil	0.61	<0.001	0.62	<0.001
Sugar-Salt	0.45	<0.001	0.54	<0.001
Sugar-Lard	0.33	<0.001	0.03	0.69
Salt-Oil	0.45	<0.001	0.62	<0.001
Salt-Lard	0.31	<0.001	-0.1	0.12
Oil-Lard	0.11	<0.001	-0.08	0.24

Supplemental Table 8: Multilevel models of energy and macronutrient intake as a function of sociodemographic, anthropometric and spatiotemporal variables. Standard errors are reported in parentheses under coefficients. Standardized coefficients (variables were centered and divided by the standard deviation) are presented for age, weight, time, distance to town (km), and education. Note that the response variables are not standardized, in contrast to Figure 5 (main text). Random effects (intercepts) for village and individual were included in the model but are not shown.

	Dependent variable:			
	Energy (kcal)	Protein	Carbohydrates	Fat
Intercept	2561.23***	125.69***	405.24***	40.26***
	(58.54)	(3.37)	(11.33)	(1.56)
Age	−61.49*	−2.49	−9.01	−1.43*
	(26.17)	(1.60)	(4.67)	(0.72)
Sex (1=male)	305.01***	16.02***	47.63***	5.38***
	(53.66)	(3.28)	(9.55)	(1.47)
Season	−144.26**	−6.73*	−29.31**	−0.25
	(54.83)	(3.36)	(10.11)	(1.53)
Weight	42.50	5.27**	5.23	0.46
	(28.22)	(1.71)	(5.04)	(0.77)
Time (day since beginning of study)	74.28**	−2.46	18.26***	1.23
	(24.83)	(1.56)	(4.50)	(0.71)
Distance to town	172.04***	12.05***	16.41*	5.14***
	(34.09)	(1.92)	(6.76)	(0.90)
Education (grade reached)	−53.73*	−1.64	−9.58*	−0.71
	(26.72)	(1.64)	(4.79)	(0.74)
Time*Distance to town	−92.00***	−0.31	−23.14***	0.23
	(27.80)	(1.72)	(5.10)	(0.78)
Num. obs.	2344	2344	2344	2344

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Supplemental Table 9: Multilevel models of energy and macronutrient intake as a function of sociodemographic, anthropometric and spatiotemporal variables, including wealth. Note that due to missingness, the inclusion of wealth greatly reduces sample size.

	Dependent variable:			
	Energy (kcal)	Protein	Carbohydrates	Fat
Intercept	2318.45***	118.98***	359.28***	37.99***
	(93.51)	(5.68)	(17.85)	(2.46)
Age	−51.03	−1.16	−6.15	−1.85
	(44.19)	(2.77)	(7.77)	(1.20)
Sex (1=male)	275.34***	12.63*	46.06**	4.16
	(83.01)	(5.21)	(14.47)	(2.26)
Season (1=wet)	209.98*	6.65	33.08*	4.44
	(86.01)	(5.41)	(15.85)	(2.40)
Weight	39.15	4.82	5.38	0.11
	(43.22)	(2.71)	(7.54)	(1.17)
Time (day since beginning of study)	149.50***	0.72	30.85***	2.34*
	(38.93)	(2.46)	(7.12)	(1.09)
Distance to town	346.25***	13.30***	54.95***	7.76***
	(65.74)	(3.88)	(12.97)	(1.66)
Education (grade reached)	−51.74	−0.27	−8.87	−1.31
	(44.00)	(2.76)	(7.84)	(1.21)
Wealth	−4.22	1.80	−7.95	1.77
	(41.12)	(2.56)	(7.27)	(1.11)
Time*Distance to town	−128.47**	−0.66	−31.30***	0.61
	(42.85)	(2.70)	(7.87)	(1.20)
Num. obs.	914	914	914	914

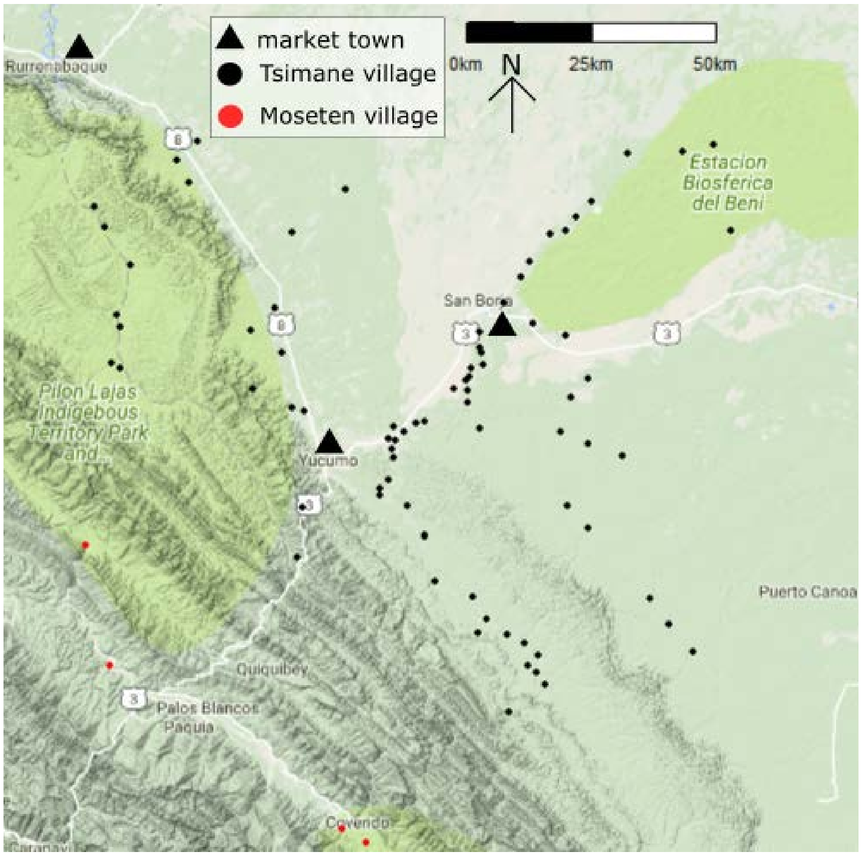
$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Supplemental Table 10: Tweedie generalized linear mixed models of LOSS consumption as a function of sociodemographic, anthropometric and spatiotemporal variables. Standard errors are reported in parentheses under coefficients. Age, weight, time, distance to town, and education were centered and scaled to improve model fitting. Models included random intercepts for individual and community.

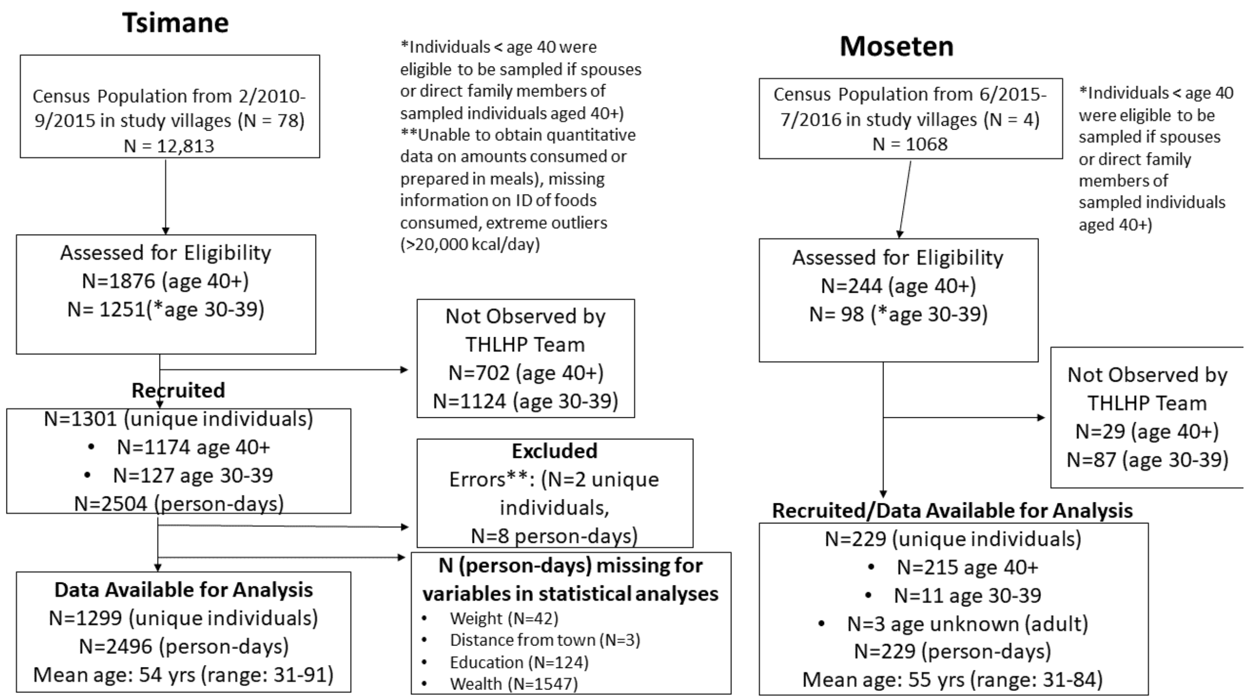
	Dependent variable			
Covariate	**Lard**	**Oil**	**Salt**	**Sugar**
Intercept	-2.61 (0.25)***	-2.05 (0.14)***	-0.74 (0.14)***	-1.07 (0.12)***
Age	0.4 (0.08)***	0.45 (0.05)***	0.44 (0.05)***	0.37 (0.04)***
Distance to town	0.03 (0.16)	-0.19 (0.1) †	0.08 (0.09)	-0.15 (0.09)
Education (grade reached)	0.07 (0.09)	0.07 (0.05)	0.08 (0.05)	0.01 (0.04)
Sex (1=male)	-0.15 (0.17)	0.11 (0.11)	0.06 (0.1)	0.04 (0.09)
Season (1=wet)	0.12 (0.17)	-0.05 (0.1)	0.3 (0.10)*	-0.07 (0.08)
Time	0.12 (0.08)	0.47 (0.05)***	0.1 (0.04)*	0.46 (0.04)***
Weight	0.07 (0.09)	-0.04 (0.06)	-0.14 (0.05)**	0.06 (0.04)
Number of obs.	1248	1251	1248	1247

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

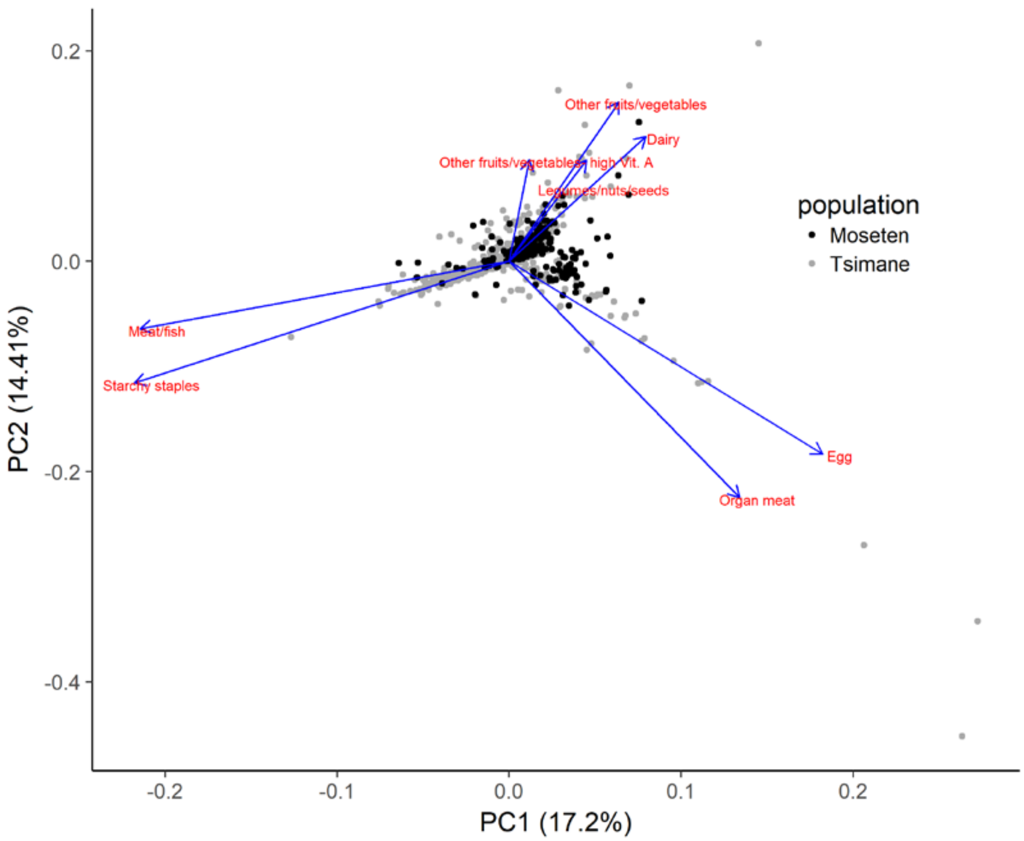
Supplemental Figures



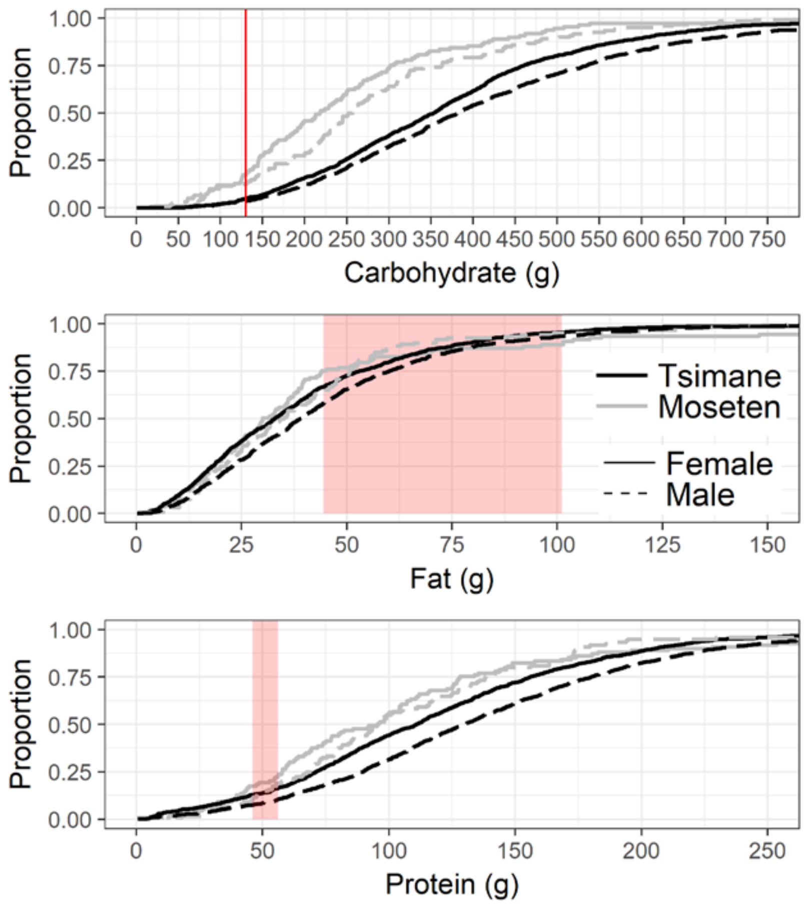
Supplemental Figure 1: Map of Tsimane/Moseten villages included in the study.



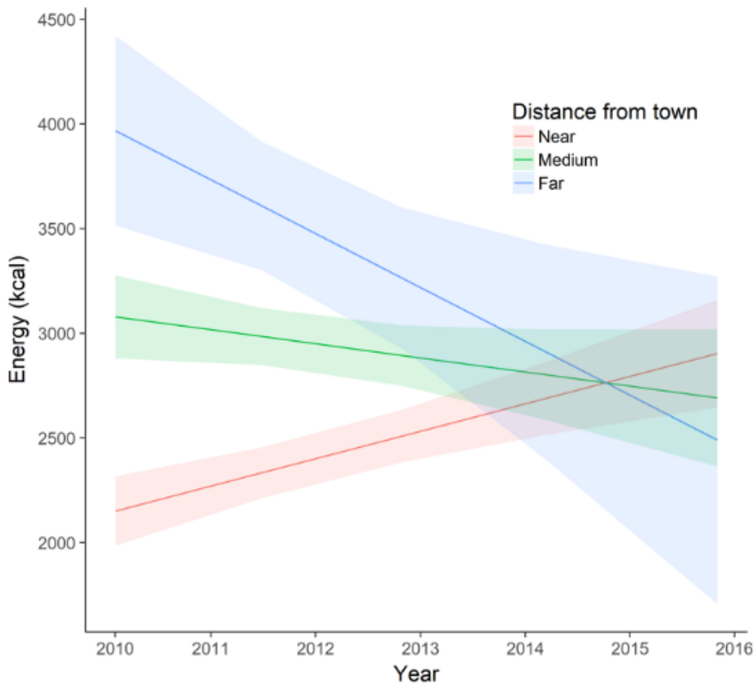
Supplemental Figure 2: Participant flowchart for Tsimane and Moseten study samples.



Supplemental Figure 3: PCA biplot of Tsimane and Moseten consumption of different food categories. Variables were scaled to unit variance for the principal components analysis.



Supplemental Figure 4: Empirical cumulative frequency distributions of macronutrient intake by population and sex. Proportions at a given level of caloric intake indicate the fraction of person-days in each population that consume less than or equal to that amount.



Supplemental Figure 5: Interaction plot showing the marginal effect of time on total caloric intake at different distances from town. Predicted values come from the linear mixed effects model in Supplemental Table 6.

References

1. INE. Bolivia características de población y vivienda: censo nacional de población y vivienda 2012. La Paz: Instituto Nacional de Estadística; 2012.

2. McAllister L, Gurven MD, Kaplan H, Stieglitz J. Why do women have more children than they want? Understanding differences in women's ideal and actual family size in a natural fertility population. Am J Hum Biol. 2012;24:786–99.

3. Gurven MD, Kaplan H. Longevity among hunter-gatherers: a cross-cultural comparison. Popul Dev Rev. 2007;33:321–65.

4. Piperno DR. The origins of plant cultivation and domestication in the new world tropics. Curr Anthropol. 2011;52:S453–70.

5. Hill K, Hawkes K, Hurtado M, Kaplan HS. Seasonal variance in the diet of Ache hunter-gatherers in Eastern Paraguay. Hum Ecol. 1984;12:101–35.

6. Martin MA, Lassek WD, Gaulin SJC, Evans RW, Woo JG, Geraghty SR, Davidson BS, Morrow AL, Kaplan HS, Gurven MD. Fatty acid composition in the mature milk of Bolivian forager-horticulturalists: controlled comparisons with a US sample. Matern Child Nutr. 2012;8:404–18.

7. Archer E, Hand G a, Blair SN. Validity of U.S. nutritional surveillance: National Health and Nutrition Examination Survey caloric energy intake data, 1971-2010. PLoS One. 2013;8:e76632.

8. Johnson RK, Driscoli P, Goran MI. Comparison of multiple-pass 24 hour recall estimates of energy intake with total energy expenditure determined by the doubly labeled water method in young children. J Am Diet Assoc. 1996;96:1140–4.

9. Ma Y, Olendzki BC, Pagoto SL, Hurley TG, Magner RP, Ockene IS, Schneider KL, Merriam PA, Hébert JR. Number of 24-hour diet recalls needed to estimate energy intake. Ann Epidemiol. 2009;19:553–9.

10. Skinner AC, Steiner MJ, Perrin EM. Self-reported energy intake by age in overweight and healthy-weight children in NHANES, 2001-2008. Pediatrics. 2012;130:e936-42.

11. Lazarte C, Encinas M, Alegre C, Granfeldt, Y. Validation of digital photographs, as a tool in 24-h recall, for the improvement of dietary assessment among rural populations in developing countries. Nutr J. 2012;11:61.

12. Dong Y, Hoover A, Scisco J, Muth E. A New Method for Measuring Meal Intake in Humans via Automated Wrist Motion Tracking. Appl Psychophysiol Biofeedback. 2012;37:205–15.

13. Ptomey LT, Willis EA, Honas JJ, Mayo MS, Washburn RA, Herrmann SD, Sullivan DK, Donnelly JE. Validity of energy intake estimated by digital photography plus recall in overweight and obese young adults. J Acad Nutr Diet. 2015;115:1392–9.

14. Lumley T. Analysis of complex survey samples. J Stat Softw. 2004;9:1–19.

15. Hatløy A, Torheim L, Oshaug A. Food variety—a good indicator of nutritional adequacy

of the diet? A case study from an urban area in Mali, West Africa. Eur J Clin Nutr. 1998;52:891–8.

16. Kennedy G, Ballard T, Dop MC. Guidelines for measuring household and individual dietary diversity. Food and Agriculture Organization of the United Nations; 2011.

17. Kaplan HS, Thompson RC, Trumble BC, Wann LS, Allam AH, Beheim BA, Frolich B, Sutherland ML, Sutherland JD, Stieglitz J, et al. Coronary atherosclerosis in indigenous South American Tsimane: a cross-sectional cohort study. Lancet. 2017;389:1730–9.

18. Gurven MD, Trumble BC, Stieglitz J, Cummings D, Blackwell A, Beheim BA, Kaplan H, Pontzer H. High resting metabolic rate among Amazonian forager-horticulturalists experiencing high pathogen burden. Am J Phys Anthropol. 2016;161:414–25.