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Supporting Information for

Energy expenditure and obesity across the economic spectrum

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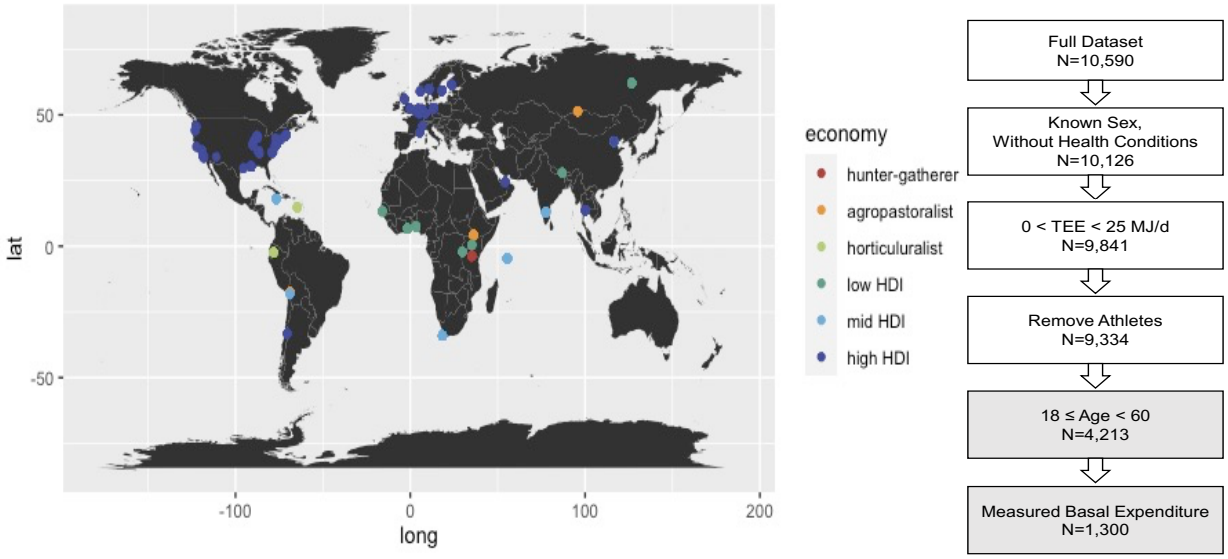

Fig. S1. Location of the populations included in this analysis. Data are from the International Atomic Energy Agency Doubly Labeled Water Database version 3.9, dlwdatabase.org. Flow chart at right shows the criteria used to determine the sample for analysis. N=4,213 measures were included in analyses of total energy expenditure. Basal energy expenditure was available for N=1,300 of these measures.

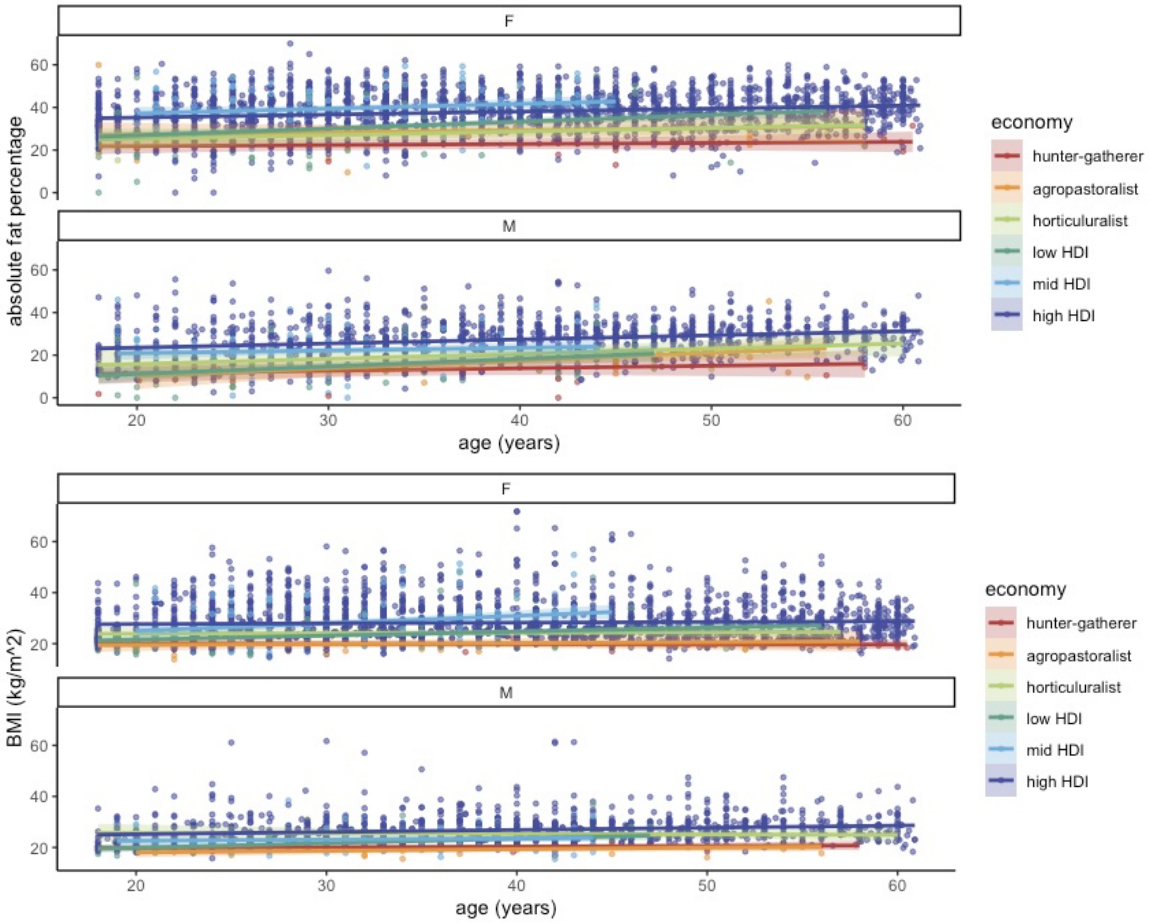

Fig. S2. Absolute fat percentage and BMI for female (F) and male (M) adults age 18 to 60 years.

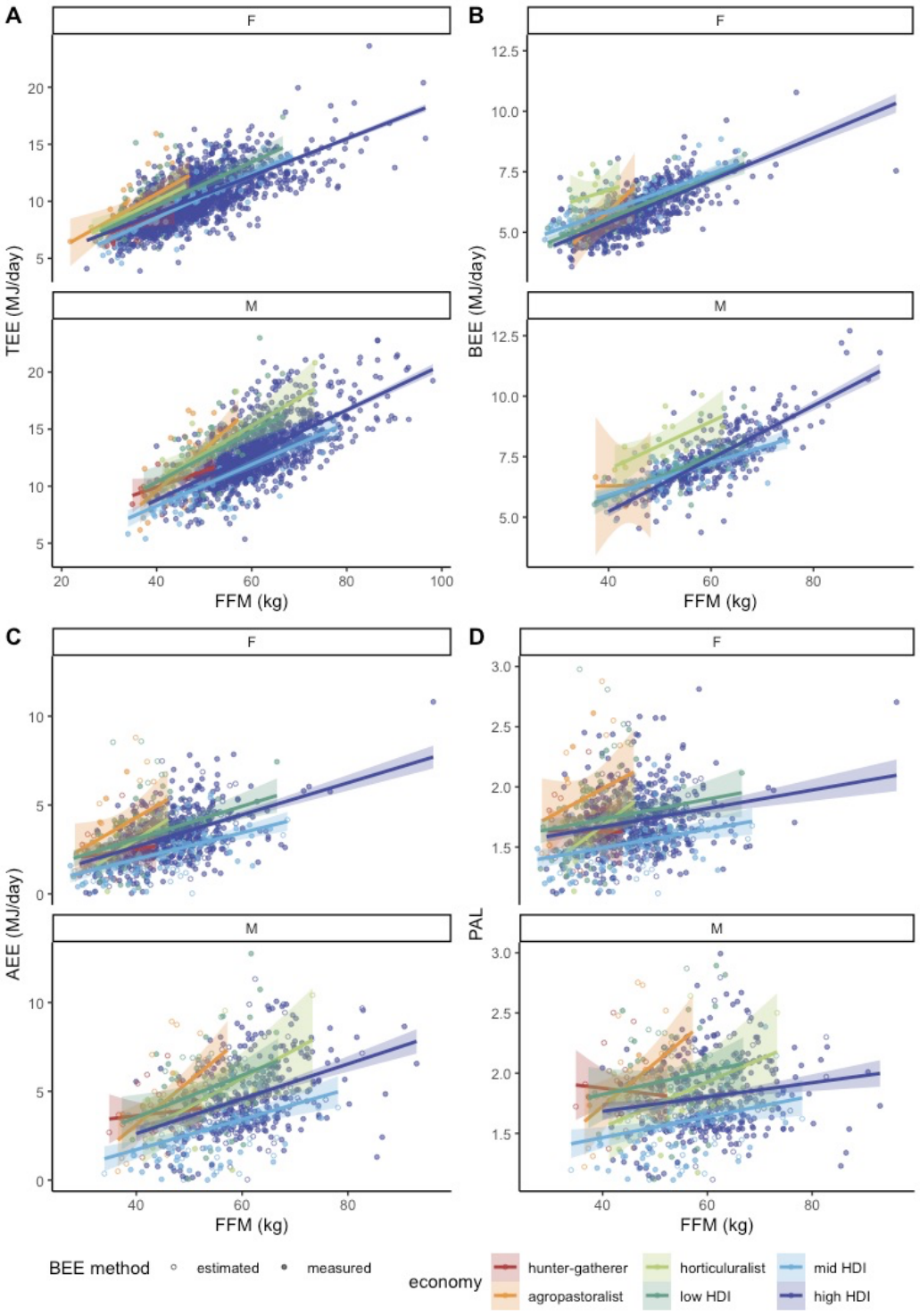

Fig. S3. Total (TEE), basal (BEE), and activity (AEE) expenditures and Physical Activity Level (PAL) increase with fat free mass (FFM) for female (F) and male (M) adults.

Table S1. Mean body fat, BMI, body mass, total expenditure (TEE), basal expenditure (BEE), activity expenditure (AEE), and PAL (TEE/BEE) across economies. Adjusted values for TEE, BEE, AEE, and PAL are percentage deviation from expected values for fat free mass, fat mass, age, and sex, calculated using residuals from a multivariate linear regression with fat free mass, fat mass, age, and sex. Adjusted values are centered around 0. See Supplementary Information.

		HG		AGP		HORT		Low HDI		Mid HDI		High HDI	
		F	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**
Fat %	**mean**	**22.61**	**13.17**	**28.67**	**17.61**	**28.83**	**21.04**	**30.7**	**15.38**	**39.82**	**22.34**	**37.85**	**27.3**
	sd	4.90	6.87	9.80	7.87	6.20	7.48	9.03	8.02	9.48	8.35	8.84	8.41
	n	20	24	32	33	24	21	185	66	155	126	2309	1218
BMI	**mean**	**19.92**	**20.15**	**19.95**	**19.22**	**24.28**	**25.26**	**23.43**	**21.99**	**28.47**	**23.14**	**28.18**	**26.85**
	sd	1.88	1.721	4.05	2.29	2.80	2.73	5.36	3.54	8.18	4.23	7.53	5.16
	n	20	22	29	24	22	18	185	66	155	126	2301	1217
Obese **(BMI ≥ 30)**	**%**	**0%**	**0%**	**5%**	**0%**	**0%**	**10%**	**9%**	**3%**	**29%**	**6%**	**15%**	**8%**
Height **(cm)**	**mean**	**150.0**	**158.7**	**160.3**	**167.9**	**150.2**	**164.4**	**159.7**	**170.2**	**162.1**	**172.2**	**164.8**	**177.9**
	sd	7.90	7.72	9.11	6.76	4.98	5.32	6.24	6.25	6.22	6.68	6.57	7.09
	n	20	24	32	33	24	21	185	66	155	126	2309	1218
Body mass **(kg)**	**mean**	**44.92**	**50.72**	**51.87**	**56.89**	**54.9**	**66.73**	**59.64**	**63.67**	**75.00**	**68.69**	**76.67**	**85.06**
	sd	6.05	5.20	8.83	7.55	8.41	9.66	13.26	10.25	22.79	13.76	21.09	17.52
	n	20	24	32	33	24	21	185	66	155	126	2309	1218
TEE **(MJ/d)**	**mean**	**7.97**	**10.47**	**9.84**	**11.98**	**9.82**	**13.47**	**9.69**	**13.31**	**9.22**	**10.59**	**9.99**	**12.90**
	sd	1.46	1.51	2.36	2.69	1.43	2.76	1.82	2.73	2.01	2.31	1.88	2.48
	n	20	24	32	33	24	21	185	66	155	126	2309	1218
Adjusted TEE **(%)**	**mean**	**1.6**		**16.1**		**15.1**		**8.5**		**-5.2**		**0.5**	
	sd	14.8		22.3		14.3		17.3		13.9		13.2	
	n	44		65		45		251		281		3527	
BEE **(MJ/d)**	**mean**	**NA**	**NA**	**5.42**	**6.31**	**6.55**	**7.98**	**5.62**	**6.97**	**6.12**	**6.70**	**5.91**	**7.51**
	sd	NA	NA	1.09	0.59	0.84	1.13	0.74	0.87	0.90	0.78	0.93	1.19
	n	0	0	4	4	11	14	154	56	99	85	532	341
Adjusted BEE **(%)**	**mean**	**NA**		**4.5**		**24.4**		**2.5**		**2.5**		**-1.0**	
	sd	NA		8.3		15.4		9.4		10.5		10.4	
	n	0		8		25		210		184		873	
AEE **(MJ/d)**	**mean**	**2.29**	**3.76**	**3.81**	**4.69**	**2.94**	**4.55**	**3.13**	**5.12**	**2.28**	**2.83**	**3.22**	**4.61**
	sd	1.16	1.31	2.06	2.23	1.20	2.54	1.38	2.29	1.17	1.71	1.32	1.94
	n	20	24	26	28	19	18	162	66	128	117	607	446
Adjusted AEE **(%)**	**mean**	**26.2**		**65.0**		**27.3**		**32.4**		**-14.9**		**12.5**	
	sd	56.4		74.8		53.2		56.6		42.9		43.0	
	n	44		54		37		228		245		994	
PAL	**mean**	**1.63**	**1.86**	**1.92**	**1.96**	**1.66**	**1.79**	**1.74**	**1.95**	**1.53**	**1.58**	**1.72**	**1.80**
	sd	0.25	0.27	0.42	0.39	0.25	0.39	0.27	0.37	0.22	0.27	0.24	0.29
	n	20	24	26	28	19	18	162	66	128	117	607	446

Table S2. Linear models for body fat percentage, BMI, and body mass across economies. Estimates (standard error) are shown for each factor in the model. When economy was used as a categorical variable, High-HDI was the referent level. Significant effects (*p<0.05, **p<0.01, ***p<0.001) in **bold**, negative effects in **blue**.

A.	**fat %**			**BMI**			**ln(body mass)**			**ln(height)**		
intercept	**34.21*** (0.17)**	**31.70** (0.47)**	**-10.49*** (3.17)**	**27.72*** (0.11)**	**26.20*** (0.37)**	**-84.92*** (1.83)**	**4.35*** (0.004)**	**4.24** (0.01)**	**-0.34*** (0.05)**	**5.13*** (0.001)**	**5.11*** (0.002)**	**4.59*** (0.01)**
ln(FFM)	--	--	**10.98*** (0.82)**	--	--	**28.94*** (0.47)**	--	--	**1.19*** (0.01)**	--	--	**0.12*** (0.004)**
sex-M	--	**-11.42* (0.28)**	**-14.42** (0.35)**	--	**-1.63** (0.21)**	**-9.56*** (0.20)**	--	**0.10*** (0.01)**	**-0.22*** (0.01)**	--	**0.07*** (0.001)**	**0.04*** (0.002)**
age	--	**0.17*** (0.01)**	**0.17*** (0.01)**	--	**0.05*** (0.01)**	**0.07*** (0.01)**	--	**0.002** (0.0003**	**0.002*** (0.0002)**	--	**-0.0002** (0.0001)**	**-0.0001* (0.0001)**
HG	**-16.75*** (1.55)**	**-13.74* (1.29)**	**-10.39** (1.29)**	**-7.68*** (1.04)**	**-7.13** (1.03)**	**1.58* (0.76)**	**-0.48*** (0.04)**	**-0.50** (0.03)**	**-0.13** (0.02)**	**-0.09*** (0.008)**	**-0.11*** (0.006)**	**-0.07*** (0.006)**
AGP	**-11.15*** (1.28)**	**-9.04** (1.07)**	**-6.31*** (1.06)**	**-8.10*** (0.92)**	**-7.73** (0.91)**	-0.13 (0.67)	**-0.36*** (0.03)**	**-0.38** (0.03)**	**-0.08*** (0.02)**	**-0.03*** (0.007)**	**-0.04*** (0.006)**	**-0.01* (0.005)**
HORT	**-9.01*** (1.54)**	**-8.02** (1.28)**	**-6.28*** (1.26)**	**-3.00** (1.06)**	**-2.97** (1.05)**	1.34 (0.76)	**-0.26*** (0.04)**	**-0.28** (0.03)**	**-0.09*** (0.02)**	**-0.08*** (0.008)**	**-0.09*** (0.006)**	**-0.07*** (0.006)**
Low HDI	**-7.54*** (0.67)**	**-7.32** (0.56)**	**-5.86*** (0.56)**	**-4.67*** (0.44)**	**-4.43** (0.44)**	-0.62 (0.32)	**-0.26*** (0.02)**	**-0.24** (0.02)**	**-0.08*** (0.01)**	**-0.04*** (0.003)**	**-0.04*** (0.003)**	**-0.02*** (0.002)**
Mid HDI	**-2.22*** (0.64)**	0.19 (0.54)	**1.36* (0.53)**	**-1.64*** (0.41)**	**-1.07** (0.42)**	**1.97*** (0.30)**	**-0.10*** (0.01)**	**-0.10** (0.01)**	**0.03*** (0.01)**	**-0.02*** (0.003)**	**-0.02*** (0.003)**	**-0.01*** (0.002)**
R2	0.07	0.36	0.39	0.05	0.07	0.51	0.14	0.18	0.74	0.08	0.48	0.59
n	4213	4213	4213	4185	4185	4185	4213	4213	4213	4185	4185	4185

B.	**fat %**			**BMI**			**ln(body mass)**			**ln(height)**		
intercept	**35.25*** (0.20)**	**32.99*** (0.48)**	**-9.05** (3.24)**	**28.38*** (0.13)**	**26.93*** (0.37)**	**-85.15*** (1.86)**	**4.39*** (0.005)**	**4.28*** (0.01)**	**-0.31*** (0.05)**	**5.14*** (0.001)**	**5.12*** (0.002)**	**4.68*** (0.01)**
ln(FFM)	--	--	**10.87*** (0.85)**	--	--	**28.99*** (0.48)**	--	--	**1.19*** (0.01)**	--	--	**0.11*** (0.004)**
sex-M	--	**-11.41*** (0.28)**	**-14.34*** (0.35)**	--	**-1.65*** (0.21)**	**-9.49*** (0.20)**	--	**0.10*** (0.01)**	**-0.22*** (0.01)**	--	**0.07*** (0.001)**	**0.04*** (0.002)**
age	--	**0.16*** (0.01)**	**0.16*** (0.01)**	--	**0.05*** (0.01)**	**0.07*** (0.01)**	--	**0.002** (0.0003)**	**0.002*** (0.0002)**	--	**-0.0002*** (0.0001)**	**-0.0001** (0.0001)**
HDI rank	**-0.05** (0.003)**	**-0.04*** (0.003)**	**-0.03*** (0.003)**	**-0.03*** (0.002)**	**-0.03*** (0.002)**	**0.005** (0.002)**	**-0.002*** (0.0001)**	**-0.002*** (0.0001)**	**-0.0004** (0.00004)**	**-0.0003*** (0.00001)**	**-0.0003*** (0.00001)**	**-0.0002*** (0.00001)**
R2	0.06	0.35	0.37	0.05	0.07	0.51	0.14	0.18	0.73	0.08	0.48	0.58
n	4213	4213	4213	4185	4185	4185	4213	4213	4213	4185	4185	4185

Table S3. Linear models of total energy expenditure (TEE), basal energy expenditure (BEE), activity energy expenditure (AEE), and physical activity level (PAL) as a function of age, sex, fat free mass (FFM), fat mass (FM), and/or economy (TEE and BEE models include only measured individuals; AEE and PAL models include individuals with both measured and estimated BEE). Estimates (standard error) are shown for each factor in the model. When economy was used as a categorical variable, High-HDI was the referent level. Significant effects (*p<0.05, **p<0.01, ***p<0.001) in **bold**, negative effects in **blue**.

A.	**ln(TEE)**			**ln(BEE)**			**ln(AEE)**			**PAL**		
intercept	**2.37*** (0.004)**	**-1.01*** (0.04)**	**-0.94*** (0.05)**	**1.86*** (0.006)**	**-1.10*** (0.06)**	**-0.70*** (0.07)**	**1.21*** (0.02)**	**-4.68*** (0.30)**	**-5.82*** (0.38)**	**1.75*** (0.01)**	**0.40** (0.13)**	**-0.11 (0.17)**
ln(FFM)	--	**0.88*** (0.01)**	**0.86*** (0.01)**	--	**0.73*** (0.01)**	**0.61*** (0.02)**	--	**1.55*** (0.07)**	**1.89*** (0.10)**	--	**0.42*** (0.03)**	**0.57*** (0.05)**
ln(FM)	--	**-0.02*** (0.004)**	**-0.02*** (0.004)**	--	**0.03*** (0.005)**	**0.06*** (0.01)**	--	**-0.07** (0.02)**	**-0.12*** (0.02)**	--	**-0.09*** (0.01)**	**-0.11*** (0.01)**
sex-M	--	--	0.01 (0.01)	--	--	**0.07*** (0.01)**	--	--	**-0.20*** (0.04)**	--	--	**-0.09*** (0.02)**
age	--	--	**-0.001** (0.0002)**	--	--	**-0.002* (0.0003)**	--	--	0.002 (0.001)	--	--	0.0002 (0.001)
HG	**-0.16*** (0.03)**	0.03 (0.02)	0.03 (0.02)	--	--	--	-0.19 (0.10)	0.13 (0.10)	0.18 (0.10)	0.0001 (0.04)	-0.004 (0.04)	0.02 (0.04)
AGP	-0.01 (0.03)	**0.15*** (0.02)**	**0.15*** (0.02)**	-0.10 (0.06)	**0.08* (0.04)**	**0.08* (0.04)**	0.08 (0.09)	**0.36*** (0.08)**	**0.40*** (0.09)**	**0.19*** (0.04)**	**0.21*** (0.04)**	**0.23*** (0.04)**
HORT	0.04 (0.03)	**0.14*** (0.02)**	**0.15*** (0.02)**	**0.12*** (0.04)**	**0.25*** (0.02)**	**0.24*** (0.02)**	-0.08 (0.11)	0.09 (0.10)	0.11 (0.10)	-0.03 (0.05)	-0.02 (0.04)	-0.0002 (0.04)
lowHDI	-0.04* (0.01)	**0.09*** (0.01)**	**0.08*** (0.01)**	**-0.08*** (0.01)**	**0.05*** (0.01)**	**0.05*** (0.01)**	-0.03 (0.05)	**0.18*** (0.05)**	**0.19*** (0.05)**	**0.05* (0.02)**	**0.06** (0.02)**	**0.06** (0.02)**
midHDI	**-0.11*** (0.01)**	**-0.05*** (0.01)**	**-0.06*** (0.01)**	-0.01 (0.01)	**0.06*** (0.01)**	**0.04*** (0.01)**	**-0.53*** (0.05)**	**-0.43*** (0.04)**	**-0.39*** (0.04)**	**-0.20*** (0.02)**	**-0.18*** (0.02)**	**-0.17*** (0.02)**
R2	0.02	0.64	0.64	0.04	0.68	0.70	0.07	0.27	0.28	0.08	0.20	0.21
n	4213	4213	4213	1300	1300	1300	1661	1661	1661	1661	1661	1661

B.	**ln(TEE)**			**ln(BEE)**			**ln(AEE)**			**PAL**		
intercept	**2.38*** (0.004)**	**-0.99*** (0.04)**	**-0.95*** (0.05)**	**1.87*** (0.007)**	**-1.15*** (0.06)**	**-0.73*** (0.08)**	**1.22*** (0.02)**	**-4.08*** (0.32)**	**-5.43*** (0.41)**	**1.74*** (0.01)**	**0.57*** (0.14)**	-0.04 (0.18)
ln(FFM)	--	**0.88*** (0.01)**	**0.87*** (0.01)**	--	**0.74*** (0.02)**	**0.61*** (0.02)**	--	**1.43*** (0.08)**	**1.82*** (0.11)**	--	**0.38*** (0.04)**	**0.56*** (0.05)**
ln(FM)	--	**-0.02*** (0.004)**	**-0.02*** (0.004)**	--	**0.03*** (0.005)**	**0.06*** (0.005)**	--	**-0.12*** (0.02)**	**-0.18*** (0.02)**	--	**-0.11*** (0.01)**	**-0.13*** (0.01)**
sex-M	--	--	-0.006 (0.01)	--	--	**0.08*** (0.01)**	--	--	**-0.23*** (0.04)**	--	--	**-0.10*** (0.02)**
age	--	--	-0.0003 (0.0002)	--	--	**-0.001** (0.0003)**	--	--	**0.004** (0.001)**	--	--	0.001 (0.0001)
HDI rank	**-0.0006*** (0.0001)**	**0.0003*** (0.00005)**	**0.0003*** (0.00005)**	**-0.0005*** (0.0001)**	**0.0005*** (0.0001)**	**0.0005*** (0.0001)**	**-0.002*** (0.0002)**	-0.0004 (0.0003)	-0.0001 (0.0003)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.00002 (0.0001)
R2	0.02	0.63	0.63	0.03	0.66	0.68	0.03	0.19	0.21	0.000	0.12	0.14
n	4213	4213	4213	1300	1300	1300	1661	1661	1661	1661	1661	1661

Table S4. A. Linear models of total energy expenditure (TEE) and economy associations with body fat %. Estimates (standard error) are shown for each factor in the model. When economy was used as a categorical variable, High-HDI was the referent level. Significant effects (*p<0.05, **p<0.01, ***p<0.001) in **bold**, negative effects in **blue**. Gray-filled rows give scaled estimate values (i.e., change per 1 standard deviation). **B.** Similar analysis using residuals from the ln(TEE)~ln(fat free mass) regression.

A.	**Women body fat %**						**Men body fat %**					
intercept	**9.13*** (2.14)**	**-33.93*** (3.70)**	**-10.79*** (2.11)**	**14.15*** (2.17)**	**-24.23*** (3.86)**	**-25.27*** (3.96)**	**17.56** (2.90)**	**-25.10*** (5.89)**	**25.62*** (2.90)**	**29.03*** (2.82)**	12.25 (6.47)	12.36 (6.52)
ln(FFM)	--	**18.73*** (1.34)**	--	--	**14.83*** (1.38)**	**16.34*** (1.39)**	--	**15.61*** (1.89)**	--	--	**4.70* (2.03)**	**5.70** (2.01)**
scaled ln(FFM)	--	**3.26*** (0.23)**	--	--	**2.58*** (0.24)**	**2.85*** (0.24)**	--	**2.43*** (0.29)**	--	--	**0.73* (0.32)**	**0.89** (0.31)**
ln(TEE)	**9.54*** (0.90)**	**-2.76* (1.23)**	**9.16*** (0.88)**	**8.27*** (0.89)**	-0.37 (1.23)	-1.99 (1.23)	-0.32 (1.10)	**-8.27** (1.44)**	**-2.35* (1.08)**	**-3.37** (1.05)**	**-4.61** (1.46)**	**-5.98*** (1.39)**
scaled ln(TEE)	**1.80*** (0.17)**	**-0.52* (0.23)**	**1.73*** (0.17)**	**1.56*** (0.17)**	-0.07 (0.23)	-0.38 (0.23)	-0.07 (0.22)	**-1.68*** (0.29)**	**-0.48* (0.22)**	**-0.68** (0.21)**	**-0.94** (0.30)**	**-1.22*** (0.28)**
age	**0.17*** (0.01)**	**0.16*** (0.01)**	**0.16*** (0.01)**	**0.15*** (0.01)**	**0.16*** (0.01)**	**0.15*** (0.01)**	**0.24*** (0.02)**	**0.22*** (0.02)**	**0.19*** (0.02)**	**0.20*** (0.02)**	**0.19*** (0.02)**	**0.19*** (0.02)**
HG	--	--	**-12.65*** (1.92)**	--	**-10.58*** (1.89)**	--	--	--	**-13.54*** (1.68)**	--	**-12.50*** (1.73)**	--
AGP	--	--	**-8.25*** (1.52)**	--	**-5.02*** (1.52)**	--	--	--	**-10.06*** (1.42)**	--	**-9.00*** (1.49)**	--
HORT	--	--	**-9.31*** (1.75)**	--	**-6.90*** (1.73)**	--	--	--	**-6.54*** (1.77)**	--	**-5.74** (1.80)**	--
Low HDI	--	--	**-5.82*** (0.66)**	--	**-4.18*** (0.66)**	--	--	--	**-10.37*** (1.03)**	--	**-9.73*** (1.06)**	--
Mid HDI	--	--	**3.86*** (0.72)**	--	**4.05*** (0.70)**	--	--	--	**-3.78*** (0.80)**	--	**-3.59*** (0.81)**	--
HDI rank	--	--	--	**-0.03*** (0.004)**	--	**-0.02*** (0.004)**	--	--	--	**-0.06*** (0.004)**	--	**-0.05*** (0.004)**
R2	0.08	0.14	0.15	0.11	0.18	0.15	0.09	0.13	0.21	0.20	0.21	0.20
n	2725	2725	2725	2725	2725	2725	1488	1488	1488	1488	1488	1488

B.	**Women body fat %**		**Men body fat %**	
intercept	**32.11*** (0.57)**	**33.52*** (0.60)**	**19.78*** (0.78)**	**20.48*** (0.78)**
scaled ln(FFM-adj TEE)	0.06 (0.17)	-0.19 (0.17)	**-0.69** (0.22)**	**-0.90*** (0.21)**
age	**0.15*** (0.01)**	**0.14*** (0.01)**	**0.19*** (0.02)**	**0.19*** (0.02)**
HG	**-14.73*** (1.95)**	--	**-12.72*** (1.66)**	--
AGP	**-8.59*** (1.56)**	--	**-9.19*** (1.43)**	--
HORT	**-9.44*** (1.79)**	--	**-5.85** (1.78)**	--
Low HDI	**-6.19*** (0.68)**	--	**-9.82*** (1.04)**	--
Mid HDI	**3.00*** (0.73)**	--	**-3.69*** (0.78)**	--
HDI rank	--	**-0.04*** (0.004)**	--	**-0.05*** (0.004)**
R2	0.11	0.08	0.21	0.20
n	2725	2725	1488	1488

Table S5. A. Linear models of total energy expenditure (TEE) and economy associations with BMI. Estimates (standard error) are shown for each factor in the model. When economy was used as a categorical variable, High-HDI was the referent level. Significant effects (*p<0.05, **p<0.01, ***p<0.001) in **bold**, negative effects in **blue**. Gray-filled rows give scaled estimate values (i.e., change per 1 standard deviation). **B.** Similar analysis using residuals from the ln(TEE)~ln(fat free mass) regression.

A.	**Women BMI**						**Men BMI**					
intercept	**25.13*** (0.41)**	**25.48*** (0.32)**	**25.64*** (0.42)**	**26.26*** (0.44)**	**25.07*** (0.34)**	**25.04*** (0.35)**	**21.85*** (0.43)**	**23.07*** (0.36)**	**22.96*** (0.44)**	**23.39*** (0.39)**	**23.30*** (0.39)**	**23.27*** (0.39)**
scaled ln(FFM)	--	**5.68*** (0.14)**	--	--	**5.69*** (0.15)**	**5.81*** (0.14)**	--	**3.43*** (0.14)**	--	--	**3.30*** (0.16)**	**3.34*** (0.15)**
scaled ln(TEE)	**3.81*** (0.12)**	-0.24 (0.14)	**3.79*** (0.12)**	**3.68*** (0.12)**	-0.17 (0.14)	**-0.28* (0.14)**	**1.97*** (0.12)**	**-0.34* (0.14)**	**1.83*** (0.12)**	**1.72*** (0.12)**	-0.27 (0.15)	**-0.31* (0.14)**
age	**0.07*** (0.01)**	**0.06*** (0.01)**	**0.06*** (0.01)**	**0.06*** (0.01)**	**0.07*** (0.01)**	**0.06*** (0.01)**	**0.11*** (0.01)**	**0.08*** (0.01)**	**0.09*** (0.01)**	**0.09*** (0.01)**	**0.07*** (0.01)**	**0.08*** (0.01)**
HG	--	--	**-3.57* (1.43)**	--	1.02 (1.15)	--	--	--	**-4.31*** (0.99)**	--	0.28 (0.89)	--
AGP	--	--	**-6.62*** (1.18)**	--	-0.07 (0.96)	--	--	--	**-6.20*** (0.94)**	--	-1.55 (0.85)	--
HORT	--	--	**-4.03** (1.36)**	--	1.48 (1.09)	--	--	--	**-2.44* (1.08)**	--	1.03 (0.96)	--
Low HDI	--	--	**-3.76*** (0.49)**	--	-0.14 (0.40)	--	--	--	**-4.41*** (0.58)**	--	**-1.51** (0.52)**	--
Mid HDI	--	--	**2.44*** (0.53)**	--	**2.86*** (0.43)**	--	--	--	**-1.08* (0.45)**	--	-0.22 (0.40)	--
HDI rank	--	--	--	**-0.02*** (0.003)**	--	**0.007** (0.002)**	--	--	--	**-0.02*** (0.002)**	--	-0.003 (0.002)
R2	0.26	0.54	0.29	0.27	0.55	0.54	0.20	0.43	0.26	0.24	0.43	0.43
n	2712	2712	2712	2712	2712	2712	1473	1473	1473	1473	1473	1473

B.	**Women BMI**		**Men BMI**	
intercept	**26.70*** (0.49)**	**27.59*** (0.50)**	**23.58*** (0.47)**	**23.93*** (0.47)**
scaled ln(FFM-adj TEE)	0.08 (0.14)	-0.05 (0.14)	-0.002 (0.13)	-0.02 (0.13)
age	**0.04** (0.01)**	**0.03** (0.01)**	**0.08*** (0.01)**	**0.09*** (0.01)**
HG	**-8.13*** (1.65)**	--	**-6.16*** (1.05)**	--
AGP	**-8.06*** (1.38)**	--	**-7.57*** (1.00)**	--
HORT	**-4.04* (1.58)**	--	-1.89 (1.16)	--
Low HDI	**-4.53*** (0.57)**	--	**-4.22*** (0.63)**	--
Mid HDI	0.57 (0.62)	--	**-3.00*** (0.47)**	--
HDI rank	--	**-0.03*** (0.003)**	--	**-0.03*** (0.003)**
R2	0.05	0.04	0.15	0.14
n	2712	2712	1473	1473

Table S6. Mean weight change and standard deviation over study period, stratified by economy and sex.

economy	sex	mean weight change (kg)	SD weight change (kg)	n
HG	F	0.20	NA	1
	M	-0.19	0.88	8
AGP		NA	NA	NA
HORT		NA	NA	NA
lowHDI	F	-0.02	0.34	46
	M	-0.03	0.16	31
midHDI	F	-0.17	0.94	134
	M	0.04	1.00	97
highHDI	F	-0.05	0.95	999
	M	0.01	1.07	491

Table S7. Linear models for the effect of dietary proportion of ultra-processed foods (proportion of total calorie intake, %UPF) and meat consumption (kg per capita) on body fat percentage. Significant effects (*p<0.05, **p<0.01, ***p<0.001) in **bold**, negative effects in **blue**.

	Percentage Body Fat							
intercept	**20.35*** (0.61)**	**20.05*** (0.99)**	**22.32*** (0.66)**	**24.40*** (0.92)**	**24.85*** (0.98)**	**24.60*** (0.97)**	**30.10*** (0.80)**	**25.14*** (0.99)**
FFM-adj. TEE	--	--	--	--	**-2.49* (1.08)**	--	**--**	**-2.97** (1.11)**
age	--	--	**0.14*** (0.01)**	**0.15*** (0.01)**	**0.14*** (0.01)**	**0.14*** (0.01)**	**0.16*** (0.01)**	**0.14*** (0.01)**
sex-M	--	--	**-10.74*** (0.30)**	**-10.82*** (0.30)**	**-10.77*** (0.30)**	**-10.82*** (0.30)**	**-11.66*** (0.29)**	**-10.76*** (0.30)**
HDI rank	--	0.002 (0.006)	--	**-0.02*** (0.005)**	**-0.02*** (0.005)**	**-0.02* (0.01)**	**-0.04*** (0.004)**	**-0.02*** (0.01)**
% UPF	**0.27*** (0.01)**	**0.28*** (0.02)**	**0.20*** (0.01)**	**0.16*** (0.02)**	**0.15*** (0.02)**	**0.17** (0.02)**	**--**	**0.16*** (0.02)**
kg_meat per capita	**--**	**--**	**--**	**--**	**--**	-0.005 (0.01)	**0.03*** (0.01)**	-0.004 (0.01)
R2	0.12	0.12	0.36	0.36	0.37	0.35	0.35	0.35
n	3649	3649	3649	3649	3649	3564	3564	3564

Table S8. Mean population summary characteristics. TEE: total energy expenditure (MJ/d). BEE: basal energy expenditure (MJ/d, measured and estimated values shown separately). AEE: activity energy expenditure (MJ/d). PAL = total / basal expenditure. PercUPF: percentage of energy intake from ultra-processed foods. Kg meat: kg of meat consumed per person per year.

Population	ISO code	HDI score	HDI rank	Economy	Sex	N	Body Mass (kg)	Height (cm)	BMI	Fat %	TEE (MJ)	BEE (MJ) (meas.)	BEE (MJ) (est.)	AEE (MJ)	PAL	adj. BMI~ TEE slope	adj. Fat% ~ TEE slope	PercUPF	UPF source	kg meat	meat source
United Arab Emirates	ARE	0.911	25	highHDI	M	10	79.65	173.90	26.34	29.94	9.06	NA	6.96	1.20	1.31	4.311	-1.359	NA	NA	NA	NA
					F	10	61.74	160.10	23.98	35.90	6.82	NA	5.40	0.74	1.25	10.831	7.337				
Australia	AUS	0.951	5	highHDI	M	6	81.43	182.50	24.44	15.34	19.32	NA	7.98	9.41	2.43	27.093	4.986	38.9	(1)	118.23	(2)
Aymara	AYM	NA	205	AGP	M	9	56.50	162.96	21.30	18.39	12.24	NA	6.17	4.85	1.98	6.141	0.792	2.5	(3)	NA	NA
					F	10	53.53	153.61	22.68	32.67	9.97	NA	5.08	3.90	1.99	-14.503	-18.373				
Belgium	BEL	0.937	16	highHDI	M	19	78.01	178.00	24.67	25.19	13.75	6.90	NA	5.47	1.99	10.332	4.298	30.3	(1)	69.64	(2)
Bolivia	BOL	0.692	119	midHDI	M	4	65.88	181.75	19.95	5.04	13.15	6.84	NA	4.99	1.93	-68.026	-2.703	9.5	(4)	67.17	(2)
					F	2	51.00	160.00	19.91	20.08	9.00	5.45	NA	2.65	1.66	NA	62.659				
Switzerland	CHE	0.962	3	highHDI	M	1	75.60	176.00	24.41	25.33	16.72	7.40	NA	7.65	2.26	NA	NA	28.7	(5)	73.03	(2)
					F	1	53.60	157.00	21.75	26.30	11.94	6.10	NA	4.64	1.96	NA	NA				
Chile	CHL	0.855	43	highHDI	M	6	55.02	167.50	19.61	9.64	11.36	NA	6.20	4.02	1.83	21.338	-0.651	28.6	(1)	82.34	(2)
China	CHN	0.768	82	midHDI	F	42	51.04	162.37	19.35	28.04	7.38	NA	5.70	0.94	1.31	-11.229	-4.659	3.6	(6)	59.17	(2)
Germany	DEU	0.942	7	highHDI	M	34	89.54	180.59	27.46	27.39	14.01	NA	7.69	4.92	1.83	-5.457	-0.212	38.45	(7)	86.76	(2)
					F	41	75.47	168.27	26.70	37.05	10.86	NA	6.21	3.57	1.75	-5.852	-2.019				
Daasanach	DSN	NA	204	AGP	M	15	52.47	170.93	17.97	14.22	10.58	NA	5.82	3.70	1.80	-6.924	4.620	2.5	Obs.	NA	NA
					F	19	49.26	163.75	18.52	24.95	9.14	NA	5.12	3.10	1.77	-27.248	2.418				
Finland	FIN	0.94	12	highHDI	M	36	80.75	177.86	25.47	25.73	14.63	7.68	NA	5.49	1.91	-3.092	-11.501	31.75	(7)	76.77	(2)
					F	30	76.41	164.27	28.31	36.48	10.30	6.01	NA	3.25	1.72	7.637	1.943				
France	FRA	0.903	28	highHDI	M	6	73.83	179.83	22.82	16.85	13.04	NA	7.34	4.39	1.77	-31.967	-15.183	20.27	(1)	88.51	(2)
					F	33	75.02	NA	NA	34.19	11.12	NA	5.84	4.16	1.94	-2.370	12.616	50.05	(1)	82.28	(2)
United Kingdom	GBR	0.929	17	highHDI	M	25	78.87	177.01	25.10	22.45	13.40	6.56	NA	5.50	2.08	-16.485	-4.111				
Ghana	GHA	0.632	135	lowHDI	M	31	62.76	168.80	22.03	14.46	12.18	6.77	NA	4.19	1.80	-6.906	-5.964	NA	NA	17.06	(2)
					F	38	63.22	157.57	25.60	32.94	9.92	5.81	NA	3.12	1.70	-9.671	-0.746				
Gambia	GMB	0.5	173	lowHDI	M	8	61.16	169.63	21.18	12.65	16.23	6.71	NA	7.90	2.40	5.999	12.474	NA	(8)	7.62	(2)
					F	7	50.19	158.50	19.99	23.08	9.66	NA	5.27	3.42	1.85	-3.901	-2.222				
Hadza	HZA	NA	206	HG	M	24	50.72	NA	NA	13.17	10.47	NA	5.66	3.76	1.85	1.314	1.171	0	(9)	167.77	(10)
					F	20	44.93	150.04	19.92	22.61	7.97	NA	4.88	2.29	1.63	10.838	-0.391				

India	IND	0.633	130	midHDI	M	19	70.96	172.45	23.93	26.04	8.99	6.90	NA	1.19	1.31	8.033	-9.311	NA	NA	NA	NA
Jamaica	JAM	0.709	110	midHDI	M	35	71.33	176.17	22.86	20.91	10.50	NA	6.84	2.61	1.52	-6.412	4.125	NA	NA	62.26	(2)
					F	37	75.61	163.37	28.29	39.42	8.84	NA	6.03	1.92	1.46	-3.833	4.130				
Kenya	KEN	0.575	150	lowHDI	M	10	56.37	174.80	18.46	6.21	14.46	NA	6.27	6.75	2.31	24.803	0.382	8.1	(11)	14.91	(2)
Nigeria	NGA	0.535	163	lowHDI	F	116	58.42	160.81	22.58	29.17	9.32	NA	5.45	2.94	1.71	-9.775	1.476	NA	NA	9.32	(2)
Netherlands	NLD	0.941	10	highHDI	F	202	73.92	167.19	26.49	35.32	10.94	NA	6.33	3.52	1.73	15.251	12.767	37	(1)	84.25	(2)
					M	228	86.94	179.93	26.82	26.76	13.83	NA	7.75	4.69	1.79	2.871	4.597				
Norway	NOR	0.961	1	highHDI	F	25	66.95	169.38	23.29	28.10	10.64	NA	6.19	3.38	1.71	-11.990	0.085	36.9	(12)	68.37	(2)
					M	12	87.10	180.58	26.67	25.66	13.61	NA	7.71	4.55	1.77	-7.027	-2.487				
Nepal	NPL	0.602	144	lowHDI	F	2	54.00	165.00	19.94	24.93	10.37	6.00	NA	3.34	1.73	-9.146	-25.798	NA	NA	12.09	(2)
					M	3	64.33	175.00	20.92	16.65	13.56	6.03	NA	6.17	2.24	-0.704	-5.357				
Rwanda	RWA	0.534	165	lowHDI	F	8	60.26	160.93	23.36	31.49	13.54	NA	5.60	6.59	2.42	12.314	1.073	NA	NA	NA	NA
Singapore	SGP	0.939	10	highHDI	M	56	86.32	173.68	28.59	32.74	11.71	NA	7.20	3.34	1.63	5.335	3.277	NA	NA	NA	NA
Shuar	SHR	NA	203	HORT	F	8	58.96	150.98	25.81	27.69	10.59	NA	5.69	3.83	1.86	-14.680	-5.394	2.5	(13)	1.29	(14)
					M	5	74.50	163.42	27.80	20.07	16.32	NA	7.19	7.50	2.26	-23.681	3.660				
Sweden	SWE	0.947	9	highHDI	M	16	69.53	179.13	21.68	16.91	14.34	NA	7.33	5.57	1.97	3.385	2.187	42.2	(7)	80.51	(2)
					F	47	70.45	168.00	24.95	30.54	10.87	NA	6.29	3.49	1.73	-5.313	-0.893				
Seychelles	SYC	0.785	69	midHDI	F	41	76.06	163.51	28.37	40.11	9.44	5.94	NA	2.55	1.59	2.457	8.738	NA	NA	NA	NA
					M	31	72.64	169.93	25.14	22.99	11.99	6.89	NA	3.90	1.74	-17.515	-6.717				
Thailand	THA	0.8	64	highHDI	F	25	53.03	158.48	21.08	31.55	6.93	4.60	NA	1.64	1.51	-13.947	1.017	NA	NA	NA	NA
					M	23	62.20	166.52	22.45	22.63	8.70	5.92	NA	1.91	1.48	0.835	1.701				
Tsimane	TSM	NA	201	HORT	F	16	52.86	150.74	23.41	29.40	9.43	NA	6.11	2.38	1.56	13.978	-6.710	2.5	Obs.	NA	NA
					M	16	64.30	162.27	24.28	21.34	12.58	NA	7.79	3.53	1.64	21.184	3.303				
Tuva	TVA	NA	202	AGP	M	9	64.64	NA	NA	22.48	14.06	NA	6.37	6.28	2.21	-23.800	NA	NA	NA	NA	NA
					F	3	62.80	NA	NA	38.88	13.86	NA	5.36	7.11	2.57	13.129	NA				
United States	USA	0.921	21	highHDI	F	1869	78.02	164.49	28.83	38.77	9.90	NA	6.09	2.82	1.63	-0.239	-1.859	55.5	(1)	115.44	(2)
					M	740	86.24	NA	NA	28.03	12.63	NA	7.43	3.93	1.69	-5.664	-0.743				
Yakut	YAK	NA	200	lowHDI	F	14	65.19	155.34	26.91	41.44	9.81	6.42	NA	2.41	1.53	36.488	26.960	NA	NA	NA	NA
					M	14	72.19	169.48	25.12	25.26	13.29	7.73	NA	4.22	1.72	-0.358	6.245				
South Africa	ZAF	0.713	102	midHDI	F	59	83.05	160.54	32.06	44.11	9.97	NA	6.28	2.69	1.60	1.380	-0.447	39.4	(15)	61.54	(2)
					M	37	62.03	169.16	21.68	23.11	10.04	NA	6.37	2.67	1.59	-7.929	-2.365				

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