Effects of consuming ounce equivalent portions of animal- vs. plant-based Protein Foods, as defined by the Dietary Guidelines for Americans on essential amino acids bioavailability in young and older adults: crossover randomized controlled trials. Gavin Connolly

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Online Supplementary Tables

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Table S1. Energy and macronutrients contents of the food items in the controlled dinner.

Food item	**Energy (kcal)**	**Fat (g)**	**CHO (g)**	**Protein (g)**
Lean Cuisine Favorites Chicken Fettucine (two packs)	580	11.6	85.2	31.9
Hawaiian roll	100	2.5	16.9	2.6
Butter, regular, salted (two packets)	68	7.7	0.0	0.1
Medium apple, fresh, with skin	95	0.3	25.1	0.5
¾ cup of yellow corn	96	0.8	22.9	3.0
Milk, 1% fat, 270 mL	113	2.6	13.5	9.1
Total	1052	25.5	163.6	47.2

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Table S2. Weight and energy and macronutrients contents of the food items in the test salad.

Food item	**Weight (g)**	**Energy (kcal)**	**Fat (g)**	**CHO (g)**	**Protein (g)**
Romaine lettuce	20	3	0.1	0.7	0.2
Mushrooms, raw	25	6	0.1	0.8	0.8
Croutons	12	49	0.8	8.8	1.4
Baby spinach, raw	50	12	0.2	1.8	1.4
Carrots, raw	62	25	0.1	5.9	0.6
Tomato, raw	70	13	0.1	2.7	0.6
Broccoli, raw	34	12	0.1	2.3	1.0
Balsamic vinaigrette dressing	31	99	10	2.8	0
Total		218	11.5	25.8	6

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Table S3. Fasting and postprandial amino acids, glucose, and insulin concentrations and positive incremental areas under the curve for young adults.

	Time (mins)							iAUCpos
	0	**30**	**60**	**120**	**180**	**240**	**300**	
				μg/mL[1]				μg/mL*300 min[2]
TAAs								
Pork	396 ± 10[a]	426 ± 10[a]	451 ± 10[a]	473 ± 10[a]	450 ± 10[a]	410 ± 10[a]	391 ± 10[a]	14671 ± 939[a]
Egg	385 ± 9[a]	413 ± 9[a]	445 ± 9[ab]	447 ± 9[b]	431 ± 9[a]	396 ± 9[ab]	385 ± 9[a]	9870 ± 963[b]
Black beans	392 ± 8[a]	402 ± 8[a]	413 ± 8[c]	406 ± 8[c]	399 ± 8[b]	386 ± 8[b]	381 ± 8[a]	6447 ± 941[c]
Almonds	397 ± 8[a]	417 ± 8[a]	406 ± 8[bc]	399 ± 8[c]	385 ± 8[b]	379 ± 8[ab]	367 ± 8[a]	4189 ± 940[c]
EAAs								
Pork	129 ± 3[a]	141 ± 3[a]	152 ± 3[a]	171 ± 3[a]	161 ± 3[a]	144 ± 3[a]	134 ± 3[a]	7346 ± 401[a]
Egg	130 ± 3[a]	139 ± 3[a]	147 ± 3[a]	158 ± 3[b]	153 ± 3[a]	137 ± 3[a]	130 ± 3[a]	4689 ± 413[b]
Black beans	124 ± 2[a]	131 ± 2[b]	132 ± 2[b]	132 ± 2[c]	131 ± 2[b]	125 ± 2[b]	121 ± 2[b]	2023 ± 402[c]
Almonds	130 ± 2[a]	137 ± 2[ab]	133 ± 2[b]	126 ± 2[c]	127 ± 2[b]	124 ± 2[b]	122 ± 2[b]	1184 ± 401[c]
BCAAs								
Pork	56 ± 2[a]	60 ± 2[a]	64 ± 2[a]	74 ± 2[a]	71 ± 2[a]	64 ± 2[a]	60 ± 2[a]	3336 ± 200[a]
Egg	56 ± 2[a]	61 ± 2[a]	64 ± 2[a]	70 ± 2[a]	70 ± 2[a]	62 ± 2[a]	59 ± 2[a]	2719 ± 206[b]
Black beans	54 ± 1[a]	57 ± 1[a]	56 ± 1[b]	56 ± 1[b]	56 ± 1[b]	54 ± 1[b]	52 ± 1[b]	716 ± 201[c]
Almonds	57 ± 1[a]	60 ± 1[a]	57 ± 1[b]	54 ± 1[b]	54 ± 1[b]	54 ± 1[b]	53 ± 1[b]	558 ± 200[c]
Leucine								
Pork	18 ± 1[a]	19 ± 1[a]	21 ± 1[a]	24 ± 1[a]	23 ± 1[a]	20 ± 1[a]	19 ± 1[a]	1118 ± 63[a]
Egg	18 ± 1[a]	19 ± 1[a]	20 ± 1[a]	22 ± 1[b]	21 ± 1[a]	19 ± 1[ab]	17 ± 1[ab]	753 ± 65[b]
Black beans	18 ± 1[a]	18 ± 1[a]	18 ± 1[b]	17 ± 1[c]	17 ± 1[b]	17 ± 1[bc]	16 ± 1[b]	201 ± 64[c]
Almonds	18 ± 1[a]	19 ± 1[a]	18 ± 1[b]	16 ± 1[c]	17 ± 1[b]	17 ± 1[c]	17 ± 1[b]	143 ± 63[c]
				mg/dL				mg/dL*300 min
Glucose								
Pork	79 ± 2[a]	88 ± 2[a]	79 ± 2[abc]	79 ± 2[abc]	80 ± 2[a]	83 ± 2[a]	82 ± 2[a]	1262 ± 164[a]
Egg	78 ± 1[a]	89 ± 1[a]	77 ± 1[ab]	76 ± 1[ab]	78 ± 1[a]	80 ± 1[a]	79 ± 1[a]	1165 ± 169[a]
Black beans	81 ± 2[a]	90 ± 2[a]	83 ± 2[ac]	79 ± 2[abc]	79 ± 2[a]	81 ± 2[a]	80 ± 2[a]	1044 ± 165[a]
Almonds	81 ± 1[a]	87 ± 1[a]	81 ± 1[abc]	80 ± 1[ac]	79 ± 1[a]	82 ± 1[a]	82 ± 1[a]	889 ± 164[a]
				μIU/mL				μIU/mL*300 min

Effects of consuming ounce equivalent portions of animal- vs. plant-based Protein Foods, as defined by the Dietary Guidelines for Americans on essential amino acids bioavailability in young and older adults: crossover randomized controlled trials. Gavin Connolly

Insulin								
Pork	14.0 ± 2.4[a]	35.2 ± 2.3[a]	31.1 ± 2.3[abc]	20.9 ± 2.3[a]	14.8 ± 2.3[a]	12.1 ± 2.3[a]	9.3 ± 2.3[a]	2139 ± 232[a]
Egg	10.3 ± 1.8[a]	33.3 ± 1.8[a]	25.0 ± 1.8[ab]	15.2 ± 1.8[a]	12.6 ± 1.8[a]	8.2 ± 1.8[a]	7.2 ± 1.8[a]	1946 ± 237[a]
Black beans	12.1 ± 2.0[a]	34.5 ± 2.0[a]	31.0 ± 2.0[ac]	18.6 ± 2.0[a]	14.5 ± 2.0[a]	10.5 ± 2.0[a]	9.3 ± 2.0[a]	2181 ± 232[a]
Almonds	11.8 ± 1.9[a]	32.7 ± 1.9[a]	25.3 ± 1.9[abc]	15.9 ± 1.9[a]	10.7 ± 1.9[a]	10.5 ± 1.9[a]	9.3 ± 1.9[a]	1892 ± 232[a]

[1] Values are least-squares means ± SE; n = 30 (15 females, 15 males). Plasma amino acids, glucose, and insulin concentrations were measured over 300 minutes. Data were analyzed using a doubly repeated measures ANOVA (proc mixed; SAS version 9.3). Differences in means were determined using a Bonferroni post hoc test. Trial-by-time interactions for TAAs, EAAs, BCAAs, leucine, and NEAAs were all significant, Tukey adjusted $P < .001$. TAA, total amino acids (sum of Ala, Arg, Apn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val); EAAs, essential amino acids (sum of His, Ile, Leu, Lys, Met, Phe, Thr, Trp, and Val); BCAAs, branched-chain amino acids (sum of Leu, Ile, and Val); NEAA, non-essential amino acids (sum of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, Pro, Ser, and Tyr); iAUCpos, positive incremental area under the curve.

[2] Values are least-squares means ± SE. Plasma amino acids, glucose, and insulin iAUCpos are reported over the 300-minute postprandial period with 0 minute time point used as baseline. Data were analyzed using a repeated measures ANOVA (proc mixed; SAS version 9.3) and differences in means were determined using a Bonferroni post hoc test, Bonferroni adjusted $P < 0.001$.

[3] Different superscript letters are significantly different from each other within time point, Bonferroni adjusted $P < 0.05$; n = 30 (15 females, 15 males).

Effects of consuming ounce equivalent portions of animal- vs. plant-based Protein Foods, as defined by the Dietary Guidelines for Americans on essential amino acids bioavailability in young and older adults: crossover randomized controlled trials. Gavin Connolly

Table S4. Fasting and postprandial amino acids, glucose, and insulin concentrations and positive incremental areas under the curve for older adults.

	Time (mins)							iAUCpos
	0	**30**	**60**	**120**	**180**	**240**	**300**	
				µg/mL[1]				µg/mL*300 min[2]
TAAs								
Pork	386 ± 9^{a}	419 ± 9^{a}	437 ± 9^{abc}	482 ± 9^{a}	459 ± 9^{a}	421 ± 9^{ab}	398 ± 9^{a}	16314 ± 1377^{a}
Egg	389 ± 9^{a}	411 ± 9^{a}	443 ± 9^{ab}	450 ± 9^{b}	437 ± 9^{a}	411 ± 9^{abc}	390 ± 9^{a}	11113 ± 1394^{b}
Black beans	388 ± 8^{a}	403 ± 8^{a}	413 ± 8^{ac}	413 ± 8^{c}	400 ± 8^{b}	389 ± 8^{ac}	385 ± 8^{a}	6786 ± 1381^{c}
Almonds	386 ± 9^{a}	411 ± 9^{a}	419 ± 9^{abc}	405 ± 9^{c}	394 ± 9^{b}	394 ± 9^{abc}	380 ± 9^{a}	6241 ± 1364^{c}
EAAs								
Pork	110 ± 4^{a}	121 ± 4^{a}	131 ± 4^{a}	154 ± 4^{a}	151 ± 4^{a}	136 ± 4^{a}	127 ± 4^{a}	8424 ± 496^{a}
Egg	113 ± 4^{a}	121 ± 4^{a}	133 ± 4^{a}	141 ± 4^{b}	140 ± 4^{a}	131 ± 4^{a}	123 ± 4^{ab}	5725 ± 502^{b}
Black beans	111 ± 2^{a}	116 ± 2^{a}	117 ± 2^{b}	116 ± 2^{c}	115 ± 2^{b}	113 ± 2^{b}	113 ± 2^{bc}	2084 ± 497^{c}
Almonds	112 ± 3^{a}	119 ± 3^{a}	119 ± 3^{b}	115 ± 3^{c}	111 ± 3^{b}	113 ± 3^{b}	111 ± 3^{c}	1368 ± 492^{c}
BCAAs								
Pork	44 ± 2^{a}	49 ± 2^{a}	53 ± 2^{a}	63 ± 2^{a}	65 ± 2^{a}	59 ± 2^{a}	56 ± 2^{a}	4268 ± 256^{a}
Egg	46 ± 2^{a}	49 ± 2^{a}	54 ± 2^{a}	59 ± 2^{b}	61 ± 2^{a}	57 ± 2^{a}	55 ± 2^{a}	3145 ± 259^{b}
Black beans	45 ± 1^{a}	47 ± 1^{a}	46 ± 1^{b}	46 ± 1^{c}	46 ± 1^{b}	47 ± 1^{b}	48 ± 1^{b}	866 ± 256^{c}
Almonds	45 ± 1^{a}	48 ± 1^{a}	47 ± 1^{b}	45 ± 1^{c}	45 ± 1^{b}	47 ± 1^{b}	47 ± 1^{b}	675 ± 254^{c}
Leucine								
Pork	14 ± 1^{a}	16 ± 1^{a}	17 ± 1^{a}	21 ± 1^{a}	21 ± 1^{a}	19 ± 1^{a}	18 ± 1^{a}	1462 ± 88^{a}
Egg	14 ± 1^{a}	16 ± 1^{a}	17 ± 1^{a}	19 ± 1^{b}	19 ± 1^{b}	18 ± 1^{a}	17 ± 1^{ab}	972 ± 89^{b}
Black beans	14 ± 1^{a}	15 ± 1^{a}	15 ± 1^{b}	14 ± 1^{c}	14 ± 1^{c}	15 ± 1^{b}	15 ± 1^{bcd}	284 ± 88^{c}
Almonds	14 ± 1^{a}	16 ± 1^{a}	15 ± 1^{b}	14 ± 1^{c}	14 ± 1^{c}	15 ± 1^{b}	15 ± 1^{cd}	195 ± 87^{c}
				mg/dL				mg/dL*300 min
Glucose								
Pork	76 ± 2^{a}	88 ± 2^{a}	83 ± 2^{a}	77 ± 2^{a}	81 ± 2^{a}	82 ± 2^{a}	83 ± 2^{a}	2001 ± 263^{a}
Egg	79 ± 3^{a}	87 ± 3^{abc}	84 ± 3^{a}	78 ± 3^{a}	80 ± 3^{a}	83 ± 3^{a}	85 ± 3^{a}	1609 ± 266^{a}
Black beans	78 ± 3^{a}	90 ± 3^{bc}	89 ± 3^{a}	79 ± 3^{a}	79 ± 3^{a}	80 ± 3^{a}	82 ± 3^{a}	2091 ± 263^{a}
Almonds	79 ± 2^{a}	88 ± 2^{abc}	84 ± 2^{a}	80 ± 2^{a}	79 ± 2^{a}	81 ± 2^{a}	82 ± 2^{a}	1472 ± 261^{a}
				µIU/mL				µIU/mL*300 min

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Insulin								
Pork	8.3 ± 1.5[a]	24.1 ± 1.5[a]	26.7 ± 1.5[abc]	13.6 ± 1.5[a]	10.1 ± 1.5[a]	6.4 ± 1.5[a]	6.0 ± 1.5[a]	1819 ± 236[a]
Egg	9.4 ± 1.4[a]	22.8 ± 1.4[a]	23.5 ± 1.4[abd]	13.8 ± 1.4[a]	10.3 ± 1.4[a]	8.3 ± 1.4[a]	7.5 ± 1.4[a]	1530 ± 239[a]
Black beans	8.1 ± 1.8[a]	24.6 ± 1.8[a]	29.4 ± 1.8[c]	13.6 ± 2.0[a]	8.6 ± 1.8[a]	7.0 ± 1.8[a]	6.5 ± 1.8[a]	1930 ± 237[a]
Almonds	8.3 ± 1.5[a]	25.8 ± 1.5[a]	21.7 ± 1.5[d]	10.6 ± 1.5[a]	7.6 ± 1.5[a]	6.4 ± 1.5[a]	6.3 ± 1.5[a]	1301 ± 236[a]

[1] Values are least-squares means ± SE; n = 25 (15 females, 10 males). Plasma amino acids, glucose, and insulin concentrations were measured over 300 minutes. Data were analyzed using a doubly repeated measures ANOVA (proc mixed; SAS version 9.3). Differences in means were determined using a Bonferroni post hoc test. Trial-by-time interactions for TAAs, EAAs, BCAAs, leucine, and NEAAs were all significant, Tukey adjusted $P < .001$. TAA, total amino acids (sum of Ala, Arg, Apn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val); EAAs, essential amino acids (sum of His, Ile, Leu, Lys, Met, Phe, Thr, Trp, and Val); BCAAs, branched-chain amino acids (sum of Leu, Ile, and Val); NEAA, non-essential amino acids (sum of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, Pro, Ser, and Tyr); iAUCpos, positive incremental area under the curve.

[2] Values are least-squares means ± SE. Plasma amino acids, glucose, and insulin iAUCpos are reported over the 300-minute postprandial period with 0 minute time point used as baseline. Data were analyzed using a repeated measures ANOVA (proc mixed; SAS version 9.3) and differences in means were determined using a Bonferroni post hoc test, Bonferroni adjusted $P < 0.05$.

[3] Different superscript letters are significantly different from each other within time point, Bonferroni adjusted $P < 0.05$; n = 25 (15 females, 10 males).

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Table S5. Fasting and postprandial amino acids, glucose, and insulin concentrations and positive incremental areas under the curve for young and older adults combined.

	Time (mins)							iAUCpos
	0	**30**	**60**	**120**	**180**	**240**	**300**	
				μg/mL[1]				μg/mL*300 min[2]
TAAs								
Pork	384 ± 7[a]	415 ± 7[a]	436 ± 7[a]	476 ± 7[a]	449 ± 7[a]	411 ± 7[a]	388 ± 7[a]	15508 ± 803[a]
Egg	384 ± 6[a]	408 ± 6[abc]	434 ± 6[a]	444 ± 6[b]	430 ± 6[b]	400 ± 6[ab]	380 ± 6[a]	10603 ± 820[b]
Black beans	378 ± 5[a]	397 ± 5[bc]	404 ± 5[b]	404 ± 5[c]	394 ± 5[c]	382 ± 5[bc]	374 ± 5[a]	6463 ± 806[c]
Almonds	385 ± 6[a]	410 ± 6[abc]	412 ± 6[b]	396 ± 6[c]	390 ± 6[c]	382 ± 6[bc]	374 ± 6[a]	5252 ± 803[c]
EAAs								
Pork	120 ± 2[a]	131 ± 2[a]	142 ± 2[a]	163 ± 2[a]	156 ± 2[a]	140 ± 2[a]	131 ± 2[a]	7900 ± 313[a]
Egg	122 ± 2[a]	130 ± 2[a]	140 ± 2[a]	149 ± 2[b]	147 ± 2[b]	134 ± 2[a]	127 ± 2[a]	5252 ± 320[b]
Black beans	117 ± 2[a]	123 ± 2[b]	125 ± 2[b]	124 ± 2[c]	123 ± 2[c]	120 ± 2[b]	117 ± 2[b]	2015 ± 314[c]
Almonds	121 ± 2[a]	128 ± 2[ab]	126 ± 2[b]	120 ± 2[c]	119 ± 2[c]	118 ± 2[b]	116 ± 2[b]	1290 ± 313[c]
BCAAs								
Pork	50 ± 1[a]	55 ± 1[a]	58 ± 1[a]	69 ± 1[a]	68 ± 1[a]	62 ± 1[a]	58 ± 1[a]	3806 ± 158[a]
Egg	51 ± 1[a]	55 ± 1[a]	59 ± 1[a]	64 ± 1[b]	65 ± 1[a]	60 ± 1[a]	57 ± 1[a]	2959 ± 162[b]
Black beans	50 ± 1[a]	52 ± 1[a]	51 ± 1[b]	51 ± 1[c]	51 ± 1[b]	51 ± 1[b]	50 ± 1[b]	775 ± 159[c]
Almonds	51 ± 1[a]	54 ± 1[a]	52 ± 1[b]	49 ± 1[c]	50 ± 1[b]	51 ± 1[b]	50 ± 1[b]	627 ± 158[c]
Leucine								
Pork	16 ± 1[a]	18 ± 1[a]	19 ± 1[a]	23 ± 1[a]	22 ± 1[a]	19 ± 1[a]	18 ± 1[a]	1295 ± 52[a]
Egg	16 ± 1[a]	17 ± 1[a]	19 ± 1[a]	20 ± 1[b]	20 ± 1[b]	18 ± 1[b]	17 ± 1[b]	868 ± 54[b]
Black beans	16 ± 1[a]	17 ± 1[a]	16 ± 1[b]	16 ± 1[c]	16 ± 1[c]	16 ± 1[c]	16 ± 1[c]	235 ± 53[c]
Almonds	16 ± 1[a]	17 ± 1[a]	16 ± 1[b]	15 ± 1[c]	15 ± 1[c]	16 ± 1[c]	16 ± 1[c]	170 ± 53[c]
				mg/dL				mg/dL*300 min
Glucose								
Pork	78 ± 1[a]	88 ± 1[a]	81 ± 1[a]	78 ± 1[a]	80 ± 1[a]	82 ± 1[a]	82 ± 1[a]	1668 ± 148[a]
Egg	78 ± 1[a]	88 ± 1[a]	80 ± 1[a]	77 ± 1[a]	79 ± 1[a]	81 ± 1[a]	82 ± 1[a]	1395 ± 151[a]
Black beans	80 ± 1[a]	91 ± 1[a]	86 ± 1[b]	79 ± 1[a]	79 ± 1[a]	81 ± 1[a]	82 ± 1[a]	1557 ± 149[a]
Almonds	80 ± 1[a]	88 ± 1[a]	82 ± 1[ab]	80 ± 1[a]	79 ± 1[a]	81 ± 1[a]	82 ± 1[a]	1164 ± 148[a]
				μIU/mL				μIU/mL*300 min

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Insulin								
Pork	11.3 ± 1.5[a]	29.8 ± 1.5[a]	29.1 ± 1.5[a]	16.4 ± 1.5[a]	12.6 ± 1.5[a]	9.4 ± 1.5[a]	7.8 ± 1.5[a]	1999 ± 169[a]
Egg	9.7 ± 1.2[a]	27.6 ± 1.2[a]	24.2 ± 1.2[b]	14.4 ± 1.2[a]	11.4 ± 1.2[a]	8.8 ± 1.2[a]	7.2 ± 1.2[a]	1749 ± 172[a]
Black beans	10.1 ± 1.4[a]	29.2 ± 1.4[a]	30.3 ± 1.4[a]	16.2 ± 1.4[a]	11.2 ± 1.4[a]	8.8 ± 1.4[a]	8.1 ± 1.4[a]	2062 ± 170[a]
Almonds	10.0 ± 1.2[a]	29.2 ± 1.2[a]	23.5 ± 1.2[b]	13.2 ± 1.2[a]	9.3 ± 1.2[a]	8.4 ± 1.2[a]	7.7 ± 1.2[a]	1588 ± 170[a]

[1] Values are least-squares means ± SE; n = 55 (30 females, 25 males). Plasma amino acids, glucose, and insulin concentrations were measured over 300 minutes. Data were analyzed using a doubly repeated measures ANOVA (proc mixed; SAS version 9.3). Differences in means were determined using a Bonferroni post hoc test. Trial-by-time interactions for TAAs, EAAs, BCAAs, leucine, and NEAAs were all significant, Tukey adjusted $P < .001$. TAA, total amino acids (sum of Ala, Arg, Apn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val); EAAs, essential amino acids (sum of His, Ile, Leu, Lys, Met, Phe, Thr, Trp, and Val); BCAAs, branched-chain amino acids (sum of Leu, Ile, and Val); NEAA, non-essential amino acids (sum of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, Pro, Ser, and Tyr); iAUCpos, positive incremental area under the curve.

[2] Values are least-squares means ± SE. Plasma amino acids, glucose, and insulin iAUCpos are reported over the 300-minute postprandial period with 0 minute time point used as baseline. Data were analyzed using a repeated measures ANOVA (proc mixed; SAS version 9.3) and differences in means were determined using a Bonferroni post hoc test, Bonferroni adjusted $P < 0.05$.

[3] Different superscript letters are significantly different from each other within time point, Bonferroni adjusted $P < 0.05$; n = 55 (30 females, 25 males).

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Table S6. Fasting and postprandial amino acids, glucose, and insulin concentrations and positive incremental areas under the curve for females.

	Time (mins)							iAUCpos
	0	**30**	**60**	**120**	**180**	**240**	**300**	
				µg/mL[1]				µg/mL*300 min[2]
TAAs								
Pork	372 ± 9[a]	404 ± 9[a]	421 ± 9[abc]	489 ± 9[a]	448 ± 9[a]	412 ± 9[a]	384 ± 9[a]	18070 ± 1078[a]
Egg	377 ± 8[a]	402 ± 8[a]	422 ± 8[b]	441 ± 8[b]	428 ± 8[a]	403 ± 8[ab]	374 ± 8[a]	11310 ± 1044[b]
Black beans	364 ± 7[a]	391 ± 7[a]	395 ± 7[c]	402 ± 7[c]	389 ± 7[b]	379 ± 7[b]	366 ± 7[a]	8047 ± 1062[bc]
Almonds	374 ± 8[a]	404 ± 8[a]	406 ± 8[abc]	399 ± 8[c]	385 ± 8[b]	379 ± 8[b]	367 ± 8[a]	6656 ± 1096[c]
EAAs								
Pork	112 ± 3[a]	123 ± 3[a]	132 ± 3[a]	163 ± 3[a]	158 ± 3[a]	143 ± 3[a]	129 ± 3[a]	7346 ± 401[a]
Egg	114 ± 3[a]	123 ± 3[a]	130 ± 3[a]	144 ± 3[b]	144 ± 3[b]	133 ± 3[a]	122 ± 3[a]	4689 ± 413[b]
Black beans	109 ± 2[a]	117 ± 2[a]	118 ± 2[b]	119 ± 2[c]	119 ± 2[c]	116 ± 2[b]	112 ± 2[b]	2023 ± 402[c]
Almonds	112 ± 2[a]	120 ± 2[a]	118 ± 2[b]	116 ± 2[c]	115 ± 2[c]	115 ± 2[b]	111 ± 2[b]	1184 ± 401[c]
BCAAs								
Pork	45 ± 2[a]	50 ± 2[a]	52 ± 2[a]	67 ± 2[a]	68 ± 2[a]	62 ± 2[a]	57 ± 2[a]	4488 ± 208[a]
Egg	46 ± 2[a]	49 ± 2[a]	52 ± 2[a]	59 ± 2[b]	62 ± 2[b]	58 ± 2[a]	54 ± 2[a]	3166 ± 206[b]
Black beans	43 ± 1[a]	46 ± 1[a]	46 ± 1[b]	47 ± 1[c]	48 ± 1[c]	47 ± 1[b]	43 ± 1[b]	1107 ± 207[c]
Almonds	44 ± 1[a]	48 ± 1[a]	46 ± 1[b]	45 ± 1[c]	45 ± 1[c]	47 ± 1[b]	46 ± 1[b]	898 ± 213[c]
Leucine								
Pork	14 ± 1[a]	16 ± 1[a]	17 ± 1[a]	22 ± 1[a]	22 ± 1[a]	19 ± 1[a]	18 ± 1[a]	1514 ± 68[a]
Egg	14 ± 1[a]	16 ± 1[a]	16 ± 1[a]	18 ± 1[b]	19 ± 1[b]	17 ± 1[b]	16 ± 1[b]	920 ± 68[b]
Black beans	14 ± 1[a]	15 ± 1[a]	15 ± 1[b]	14 ± 1[c]	15 ± 1[c]	15 ± 1[c]	15 ± 1[b]	332 ± 68[c]
Almonds	14 ± 1[a]	15 ± 1[a]	14 ± 1[b]	13 ± 1[c]	14 ± 1[c]	15 ± 1[c]	14 ± 1[b]	236 ± 70[c]
				mg/dL				mg/dL*300 min
Glucose								
Pork	77 ± 2[a]	86 ± 2[a]	81 ± 2[a]	77 ± 2[a]	80 ± 2[a]	81 ± 2[a]	82 ± 2[a]	1651 ± 195[a]
Egg	78 ± 2[a]	86 ± 2[a]	77 ± 2[a]	77 ± 2[a]	79 ± 2[a]	82 ± 2[a]	82 ± 2[a]	1462 ± 193[a]
Black beans	79 ± 2[a]	89 ± 2[a]	84 ± 2[a]	79 ± 2[a]	79 ± 2[a]	81 ± 2[a]	82 ± 2[a]	1594 ± 193[a]
Almonds	78 ± 2[a]	86 ± 2[a]	80 ± 2[a]	78 ± 2[a]	79 ± 2[a]	82 ± 2[a]	82 ± 2[a]	1229 ± 199[a]
				µIU/mL				µIU/mL*300 min

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Insulin								
Pork	10.0 ± 2.0[a]	28.6 ± 2.0[a]	26.6 ± 2.0[abc]	14.7 ± 2.0[a]	12.0 ± 2.0[a]	10.2 ± 2.0[a]	7.3 ± 2.0[a]	2061 ± 224[a]
Egg	8.8 ± 1.6[a]	25.7 ± 1.6[a]	22.6 ± 1.6[ab]	14.1 ± 1.6[a]	12.1 ± 1.6[a]	9.0 ± 1.6[a]	7.1 ± 1.6[a]	1780 ± 223[a]
Black beans	8.9 ± 1.9[a]	28.4 ± 1.9[a]	28.7 ± 1.9[c]	15.1 ± 1.9[a]	10.0 ± 1.9[a]	7.8 ± 1.9[a]	7.1 ± 1.9[a]	2045 ± 223[a]
Almonds	9.0 ± 1.7[a]	27.5 ± 1.7[a]	19.9 ± 1.7[d]	10.6 ± 1.7[a]	8.5 ± 1.7[a]	7.4 ± 1.7[a]	7.0 ± 1.7[a]	1376 ± 227[a]

[1] Values are least-squares means ± SE; n = 30 females. Plasma amino acids, glucose, and insulin concentrations were measured over 300 minutes. Data were analyzed using a doubly repeated measures ANOVA (proc mixed; SAS version 9.3). Differences in means were determined using a Bonferroni post hoc test. Trial-by-time interactions for TAAs, EAAs, BCAAs, leucine, and NEAAs were all significant, Tukey adjusted $P < .001$. TAA, total amino acids (sum of Ala, Arg, Apn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val); EAAs, essential amino acids (sum of His, Ile, Leu, Lys, Met, Phe, Thr, Trp, and Val); BCAAs, branched-chain amino acids (sum of Leu, Ile, and Val); NEAA, non-essential amino acids (sum of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, Pro, Ser, and Tyr); iAUCpos, positive incremental area under the curve.

[2] Values are least-squares means ± SE. Plasma amino acids, glucose, and insulin iAUCpos are reported over the 300-minute postprandial period with 0 minute time point used as baseline. Data were analyzed using a repeated measures ANOVA (proc mixed; SAS version 9.3) and differences in means were determined using a Bonferroni post hoc test, Bonferroni adjusted $P < 0.05$.

[3] Different superscript letters are significantly different from each other within time point, Bonferroni adjusted $P < 0.05$; n = 30).

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Table S7. Fasting and postprandial amino acids, glucose, and insulin concentrations and positive incremental areas under the curve for males.

	Time (mins)							iAUCpos
	0	**30**	**60**	**120**	**180**	**240**	**300**	
				μg/mL[1]				μg/mL*300 min[2]
TAAs								
Pork	396 ± 10[a]	426 ± 10[a]	451 ± 10[a]	473 ± 10[a]	450 ± 10[a]	410 ± 10[a]	391 ± 10[a]	12947 ± 1155[a]
Egg	390 ± 9[a]	413 ± 9[a]	445 ± 9[a]	447 ± 9[a]	431 ± 9[a]	396 ± 9[a]	385 ± 9[a]	9976 ± 1235[a]
Black beans	392 ± 8[a]	402 ± 8[a]	413 ± 8[b]	406 ± 8[b]	399 ± 8[b]	386 ± 8[a]	381 ± 8[a]	4879 ± 1169[b]
Almonds	397 ± 8[a]	417 ± 8[a]	417 ± 8[ab]	399 ± 8[b]	385 ± 8[b]	384 ± 8[a]	367 ± 8[a]	3848 ± 1152[b]
EAAs								
Pork	127 ± 4[a]	140 ± 4[a]	151 ± 4[a]	163 ± 4[a]	155 ± 4[a]	138 ± 4[a]	132 ± 4[a]	6603 ± 455[a]
Egg	129 ± 3[a]	137 ± 3[a]	149 ± 3[a]	155 ± 3[a]	150 ± 3[a]	134 ± 3[a]	131 ± 3[a]	4692 ± 480[a]
Black beans	126 ± 2[a]	130 ± 2[a]	131 ± 2[b]	129 ± 2[b]	126 ± 2[b]	122 ± 2[b]	122 ± 2[a]	1213 ± 460[b]
Almonds	129 ± 2[a]	135 ± 2[a]	133 ± 2[b]	126 ± 2[b]	124 ± 2[b]	122 ± 2[b]	122 ± 2[a]	787 ± 455[b]
BCAAs								
Pork	55 ± 2[a]	60 ± 2[a]	65 ± 2[a]	71 ± 2[a]	69 ± 2[a]	61 ± 2[a]	59 ± 2[a]	3123 ± 231[a]
Egg	56 ± 2[a]	60 ± 2[a]	65 ± 2[a]	70 ± 2[a]	68 ± 2[a]	61 ± 2[a]	60 ± 2[a]	2752 ± 244[a]
Black beans	56 ± 1[a]	57 ± 1[a]	57 ± 1[b]	56 ± 1[b]	55 ± 1[b]	54 ± 1[b]	53 ± 1[b]	443 ± 234[b]
Almonds	57 ± 1[a]	60 ± 1[a]	59 ± 1[b]	54 ± 1[b]	54 ± 1[b]	54 ± 1[b]	54 ± 1[b]	355 ± 231[b]
Leucine								
Pork	18 ± 1[a]	20 ± 1[a]	21 ± 1[a]	23 ± 1[a]	22 ± 1[a]	19 ± 1[a]	19 ± 1[a]	1075 ± 76[a]
Egg	18 ± 1[a]	19 ± 1[a]	21 ± 1[a]	22 ± 1[a]	21 ± 1[a]	19 ± 1[ab]	18 ± 1[ab]	816 ± 80[a]
Black beans	18 ± 1[a]	18 ± 1[a]	18 ± 1[b]	17 ± 1[b]	17 ± 1[b]	17 ± 1[b]	16 ± 1[b]	138 ± 77[b]
Almonds	18 ± 1[a]	20 ± 1[a]	19 ± 1[b]	17 ± 1[b]	17 ± 1[b]	17 ± 1[b]	17 ± 1[ab]	104 ± 76[b]
				mg/dL				mg/dL*300 min
Glucose								
Pork	78 ± 2[a]	90 ± 2[a]	81 ± 2[a]	78 ± 2[a]	81 ± 2[a]	83 ± 2[a]	83 ± 2[a]	1685 ± 216[a]
Egg	79 ± 2[a]	90 ± 2[a]	83 ± 2[a]	77 ± 2[a]	79 ± 2[a]	81 ± 1[a]	82 ± 2[a]	1462 ± 229[a]
Black beans	81 ± 2[a]	86± 2[a]	80 ± 2[a]	78 ± 2[a]	79 ± 2[a]	82 ± 2[a]	82 ± 2[a]	1594 ± 219[a]
Almonds	81 ± 2[a]	89 ± 2[a]	84 ± 2[a]	81 ± 2[a]	79 ± 2[a]	81 ± 2[a]	82 ± 2[a]	1098 ± 216[a]
				μIU/mL				μIU/mL*300 min

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Insulin								
Pork	12.7 ± 2.2[a]	31.1 ± 2.2[a]	31.6 ± 2.2[abc]	18.9 ± 2.2[a]	13.2 ± 2.2[a]	8.6 ± 2.2[a]	8.3 ± 2.2[a]	1936 ± 250[a]
Egg	10.8 ± 1.8[a]	29.6 ± 1.8[a]	25.9 ± 1.8[ab]	14.8 ± 1.8[a]	10.6 ± 1.8[a]	7.3 ± 1.8[a]	7.4 ± 1.8[a]	1717 ± 259[a]
Black beans	11.4 ± 2.1[a]	30.1 ± 2.1[a]	31.9 ± 2.1[ac]	17.2 ± 2.1[a]	12.5 ± 2.1[a]	9.8 ± 2.1[a]	8.9 ± 2.1[a]	2078 ± 251[a]
Almonds	11.1 ± 1.8[a]	30.9 ± 1.8[a]	27.0 ± 1.8[abc]	15.9 ± 1.8[a]	10.1 ± 1.8[a]	9.5 ± 1.8[a]	8.5 ± 1.8[a]	1799 ± 249[a]

[1] Values are least-squares means ± SE; n = 25 males. Plasma amino acids, glucose, and insulin concentrations were measured over 300 minutes. Data were analyzed using a doubly repeated measures ANOVA (proc mixed; SAS version 9.3). Differences in means were determined using a Bonferroni post hoc test. Trial-by-time interactions for TAAs, EAAs, BCAAs, leucine, and NEAAs were all significant, Tukey adjusted $P < .001$. TAA, total amino acids (sum of Ala, Arg, Apn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val); EAAs, essential amino acids (sum of His, Ile, Leu, Lys, Met, Phe, Thr, Trp, and Val); BCAAs, branched-chain amino acids (sum of Leu, Ile, and Val); NEAA, non-essential amino acids (sum of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, Pro, Ser, and Tyr); iAUCpos, positive incremental area under the curve.

[2] Values are least-squares means ± SE. Plasma amino acids, glucose, and insulin iAUCpos are reported over the 300-minute postprandial period with 0 minute time point used as baseline. Data were analyzed using a repeated measures ANOVA (proc mixed; SAS version 9.3) and differences in means were determined using a Bonferroni post hoc test, Bonferroni adjusted $P < 0.05$.

[3] Different superscript letters are significantly different from each other within time point, Bonferroni adjusted $P < 0.05$; n = 25.