

Table S1 Examples of commercially available products containing edible insects (adapted from [www.bugburger.se](http://www.bugburger.se))

	Name	Picture
1	Bar (protein bar energy bar)	
2	Beer	
3	Bread	
4	Burgers	
5	Cookies	
6	Crackers	
7	Crisps/Chips	

8	Noodles	  
9	Oil	
10	Pancake mix	  
11	Pasta	     
12	Protein powder/shakes	   

Table S2 Amino acid profile of raw materials and products.

	Non-essential amino acids (non-EAA) mg · g <sup>-1</sup> of protein									Total non-EAA
	Alanine	Arginine	Aspartic acid	Cysteine	Glutamic acid	Glycine	Proline	Serine	Tyrosine	
BW	75.85 <sup>d</sup> ±1.25	62.03 <sup>a</sup> ±1.70	97.81 <sup>cb</sup> ±2.34	11.40 <sup>a</sup> ±0.36	144.18 <sup>b</sup> ±3.42	51.24 <sup>fe</sup> ±1.10	74.34 <sup>de</sup> ±1.50	47.50 <sup>b</sup> ±1.05	90.10 <sup>h</sup> ±2.44	654.45 <sup>b</sup> ±14.39
CF	99.77 <sup>f</sup> ±1.43	70.21 <sup>bc</sup> ±0.71	94.56 <sup>bc</sup> ±1.23	10.71 <sup>a</sup> ±0.60	126.30 <sup>a</sup> ±1.69	60.26 <sup>b</sup> ±0.70	64.27 <sup>b</sup> ±0.88	48.43 <sup>b</sup> ±0.77	58.62 <sup>f</sup> ±0.74	633.15 <sup>b</sup> ±7.56
TM	80.32 <sup>e</sup> ±1.51	60.36 <sup>a</sup> ±1.15	91.06 <sup>b</sup> ±1.52	10.98 <sup>a</sup> ±0.41	130.72 <sup>a</sup> ±2.35	56.72 <sup>g</sup> ±1.04	79.56 <sup>f</sup> ±1.32	49.673 <sup>b</sup> ±0.97	74.59 <sup>g</sup> ±1.6	633.98 <sup>b</sup> ±11.09
CN	32.14 <sup>a</sup> ±0.64	91.15 <sup>d</sup> ±2.11	76.70 <sup>a</sup> ±2.39	16.809 <sup>b</sup> ±2.03	182.88 <sup>c</sup> ±3.19	35.57 <sup>a</sup> ±0.72	28.10 <sup>a</sup> ±0.95	42.15 <sup>a</sup> ±0.82	27.99 <sup>a</sup> ±0.44	533.48 <sup>a</sup> ±12.82
HN	40.48 <sup>b</sup> ±1.43	124.77 <sup>e</sup> ±3.29	91.97 <sup>bc</sup> ±2.45	15.75 <sup>b</sup> ±0.65	209.27 <sup>de</sup> ±5.04	40.58 <sup>b</sup> ±1.47	27.56 <sup>a</sup> ±0.99	39.95 <sup>a</sup> ±1.10	25.27 <sup>a</sup> ±0.90	615.59 <sup>b</sup> ±16.23
ST	65.93 <sup>c</sup> ±4.97	72.59 <sup>cb</sup> ±6.16	114.68 <sup>e</sup> ±10.34	30.43 <sup>e</sup> ±0.63	277.31 <sup>g</sup> ±23.60	45.97 <sup>dc</sup> ±4.00	80.34 <sup>f</sup> ±7.08	93.52 <sup>f</sup> ±8.20	41.18 <sup>b</sup> ±2.95	821.95 <sup>e</sup> ±66.36
BW15	64.95 <sup>c</sup> ±0.26	66.29 <sup>b</sup> ±0.68	106.04 <sup>d</sup> ±0.43	25.27 <sup>d</sup> ±0.32	222.36 <sup>ef</sup> ±1.64	44.02 <sup>c</sup> ±0.67	70.20 <sup>cd</sup> ±1.67	77.50 <sup>de</sup> ±0.47	49.07 <sup>de</sup> ±1.05	725.70 <sup>dc</sup> ±6.08
BW30	71.72 <sup>d</sup> ±0.49	69.05 <sup>bc</sup> ±1.19	110.60 <sup>d</sup> ±1.03	24.54 <sup>d</sup> ±0.04	211.03 <sup>def</sup> ±1.60	47.90 <sup>de</sup> ±0.52	72.043 <sup>c</sup> ±0.64	75.71 <sup>d</sup> ±0.69	59.19 <sup>f</sup> ±1.99	741.79 <sup>d</sup> ±6.85
CF15	73.79 <sup>d</sup> ±0.42	69.56 <sup>bc</sup> ±0.39	105.68 <sup>d</sup> ±1.02	25.23 <sup>d</sup> ±0.26	223.15 <sup>ef</sup> ±0.95	47.96 <sup>de</sup> ±0.21	72.06 <sup>de</sup> ±0.51	78.41 <sup>de</sup> ±0.44	46.26 <sup>cd</sup> ±2.03	742.10 <sup>d</sup> ±2.07
CF30	73.79 <sup>d</sup> ±5.15	68.31 <sup>bc</sup> ±1.47	104.82 <sup>d</sup> ±2.09	23.12 <sup>c</sup> ±0.88	195.04 <sup>c</sup> ±4.41	48.67 <sup>def</sup> ±1.08	65.97 <sup>bc</sup> ±1.74	72.14 <sup>cd</sup> ±1.24	45.84 <sup>c</sup> ±1.85	697.70 <sup>c</sup> ±17.44
TM15	68.43 <sup>cd</sup> ±3.60	69.24 <sup>bc</sup> ±3.05	106.55 <sup>d</sup> ±5.03	24.67 <sup>d</sup> ±0.38	230.88 <sup>fe</sup> ±11.18	47.89 <sup>de</sup> ±2.44	75.73 <sup>ef</sup> ±4.98	81.14 <sup>ed</sup> ±4.16	50.453 <sup>ed</sup> ±3.07	754.98 <sup>d</sup> ±35.82
TM30	73.92 <sup>d</sup> ±4.69	70.28 <sup>bc</sup> ±4.24	110.07 <sup>d</sup> ±5.08	25.64 <sup>d</sup> ±0.45	207.96 <sup>d</sup> ±12.08	50.75 <sup>ef</sup> ±3.17	74.36 <sup>de</sup> ±5.06	78.98 <sup>de</sup> ±4.25	56.90 <sup>f</sup> ±3.67	748.87 <sup>d</sup> ±42.02

HN – hazelnut, CN – cashews nuts, CF - cricket *A. domesticus*, TM - mealworm *T. molitor*, BW - buffalo worm *A. diaperinu*

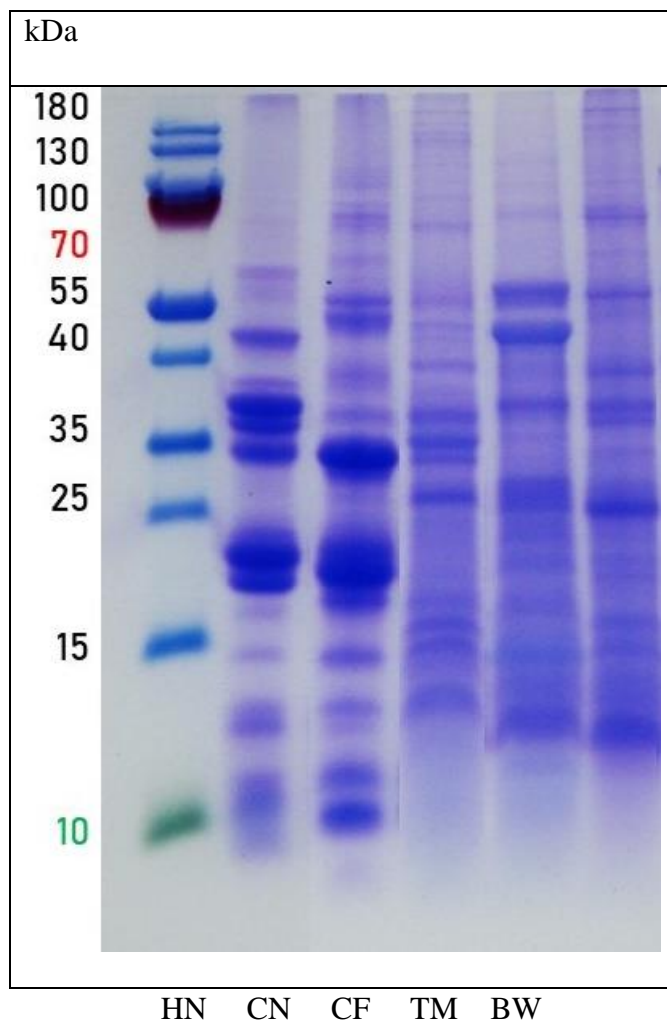


Figure S1 Protein profiles of selected raw materials analyzed by SDS-PAGE

Explanatory notes:

HN – hazelnut, CN – cashews nuts, CF - cricket *A. domesticus*, TM - mealworm *T. molitor*, BW - buffalo worm *A. diaperinus*

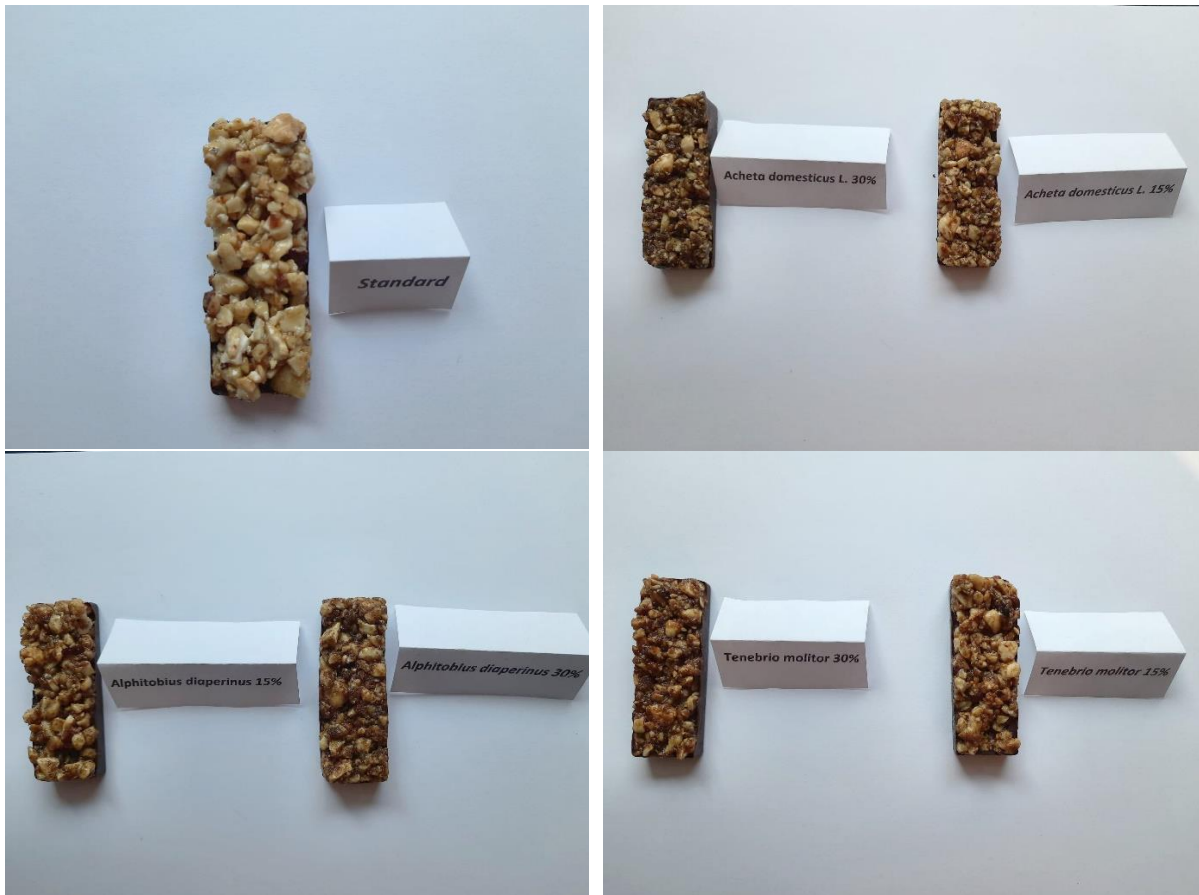


Figure S2 Nut bars with various levels of edible insects flour substitution - overall appearance

Table S3 Concentration of individual volatile compounds in edible insect flours (g/100g).

Volatile compounds	BW	CF	TM
Acetaldehyde	4.50 <sup>b</sup> ±0.14*	4.56 <sup>c</sup> ±0.13	0.08 <sup>a</sup> ±0.02
2-Propanol	26.04 <sup>c</sup> ±0.18	21.70 <sup>b</sup> ±0.17	7.79 <sup>a</sup> ±0.11
2-Methylpropanal	0.01 <sup>a</sup> ±0.01	1.83 <sup>c</sup> ±0.05	0.05 <sup>b</sup> ±0.02
Butanal	0.67 <sup>a</sup> ±0.04	2.34 <sup>c</sup> ±0.08	1.55 <sup>b</sup> ±0.05
Butan-2-one	7.36 <sup>c</sup> ±0.09	0.28 <sup>a</sup> ±0.04	2.64 <sup>b</sup> ±0.08
Ethyl Acetate	0.29 <sup>b</sup> ±0.03	5.61 <sup>c</sup> ±0.09	0.15 <sup>a</sup> ±0.03
Acetic acid	7.40 <sup>c</sup> ±0.11	1.14 <sup>b</sup> ±0.07	0.64 <sup>a</sup> ±0.06
3-Methylbutanal	1.87 <sup>b</sup> ±0.08	1.28 <sup>a</sup> ±0.11	1.92 <sup>c</sup> ±0.13
2,3-Pentanedione	2.42 <sup>b</sup> ±0.07	1.80 <sup>a</sup> ±0.09	14.82 <sup>c</sup> ±0.19
Hexanal	5.10 <sup>a</sup> ±0.10	11.75 <sup>c</sup> ±0.18	8.70 <sup>b</sup> ±0.21
Butanoic acid	9.06 <sup>c</sup> ±0.12	4.79 <sup>b</sup> ±0.15	0.18 <sup>a</sup> ±0.06
Furfural	3.51 <sup>c</sup> ±0.11	0.37 <sup>a</sup> ±0.07	0.54 <sup>b</sup> ±0.08
3-Methylbutanoic acid	11.61 <sup>a</sup> ±0.24	35.31 <sup>b</sup> ±0.69	55.16 <sup>c</sup> ±0.87
1-Hexanol	0.88 <sup>c</sup> ±0.09	0.38 <sup>a</sup> ±0.05	0.67 <sup>b</sup> ±0.07
Heptanal	3.13 <sup>c</sup> ±0.10	0.98 <sup>b</sup> ±0.06	0.73 <sup>a</sup> ±0.08
Ethyl hexanoate	2.40 <sup>c</sup> ±0.11	0.52 <sup>b</sup> ±0.04	0.02 <sup>a</sup> ±0.01
2,5-Dimethylpyrazine	0.74 <sup>c</sup> ±0.06	0.01 <sup>a</sup> ±0.01	0.52 <sup>b</sup> ±0.06
2,3-Dimethylpyrazine	0.82 <sup>a</sup> ±0.07	0.91 <sup>b</sup> ±0.09	0.82 <sup>a</sup> ±0.07
2,4-Heptadienal	0.50 <sup>b</sup> ±0.04	1.25 <sup>c</sup> ±0.12	0.39 <sup>a</sup> ±0.05
Benzaldehyde	3.05 <sup>c</sup> ±0.09	0.24 <sup>a</sup> ±0.08	0.35 <sup>b</sup> ±0.04
Hexanoic acid	0.19 <sup>b</sup> ±0.09	0.44 <sup>c</sup> ±0.09	0.07 <sup>a</sup> ±0.02
Trimethylpyrazine	0.09 <sup>b</sup> ±0.02	0.03 <sup>a</sup> ±0.02	0.69 <sup>c</sup> ±0.03
Tetramethylpyrazine	0.09 <sup>a</sup> ±0.03	0.84 <sup>c</sup> ±0.10	0.82 <sup>b</sup> ±0.06
2-Phenylethanol	1.53 <sup>c</sup> ±0.10	0.16 <sup>b</sup> ±0.08	0.08 <sup>c</sup> ±0.02
Phenylethyl acetate	0.01 <sup>a</sup> ±0.01	0.01 <sup>a</sup> ±0.01	0.01 <sup>a</sup> ±0.01
Maltol	0.26 <sup>c</sup> ±0.04	0.07 <sup>b</sup> ±0.01	0.02 <sup>a</sup> ±0.01
gamma-Nonalactone	0.66 <sup>c</sup> ±0.07	0.51 <sup>b</sup> ±0.08	0.23 <sup>a</sup> ±0.08
Eugenol	1.34 <sup>b</sup> ±0.10	0.12 <sup>a</sup> ±0.03	0.12 <sup>a</sup> ±0.04
delta-Nonalacton	0.01 <sup>a</sup> ±0.01	0.09 <sup>b</sup> ±0.02	0.01 <sup>a</sup> ±0.01
Pentyl octanoate	1.95 <sup>b</sup> ±0.12	0.01 <sup>a</sup> ±0.01	0.01 <sup>a</sup> ±0.01
Myristicin	0.65 <sup>c</sup> ±0.06	0.20 <sup>b</sup> ±0.13	0.01 <sup>a</sup> ±0.01
E-nerolidol	0.35 <sup>c</sup> ±0.05	0.12 <sup>b</sup> ±0.13	0.01 <sup>a</sup> ±0.01

\*Values in the same row marked with different letters are statistically significantly different at  $p < 0.05 \pm \text{SD}$ .  
CF - cricket *A. domesticus*, TM - mealworm *T. molitor*, BW - buffalo worm *A. diaperinus*