

RESEARCH ARTICLE

**Black soldier fly larvae efficiently bioconvert the organic fraction of municipal solid waste thanks to the functional plasticity of their midgut**

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**Supplementary material**

TABLE S1 Composition of s-OFMSW and modified s-OFMSW. Values are expressed as g/100 g of diet

	s-OFMSW	modified s-OFMSW
Bread	31	15
Pork meat	18	5
Mozzarella cheese	10	5
Banana	6	15
Pear	5	15
Apple	5	15
Carrot	13	15
Potato	12	15

TABLE S2 Sequences of primers used in this study

Primer name	Sequence
Try_DN11026_F	GTTGTATTGACCGCTCTACTT
Try_DN11026_R	GCGGCAGTAACAACAACGTT
Try_DN13300_F	TTCAAGTACTTTCATCTTAACTGCTGCTC
Try_DN13300_R	TCTTGCCAGTTTTTCGATACTCC
Try_DN11081_F	TGAGAATGTTGACTGCGCTG
Try_DN11081_R	TAATCAATGGACCACCAGAG
Chy_DN12383_F	GCAGCCACTGTTGTTCTTGG
Chy_DN12383_R	GCTGGCTTCGCTCTTCTTTG
Chy_DN8352_F	TTCGAGTTCCTGCTGCGAAT
Chy_DN8352_R	AGCGTTCCTTCCCCATCCTG
Chy_DN8552_F	CGAAGAAGAAGGTCGCCTCA
Chy_DN8552_R	ATTAGTGCGTCCCCAACCTG
Chy_DN9167_F	TCGTCCATGCTGCCTATGATC
Chy_DN9167_R	TTGCAGATAGGTACGGGCTG
APN_DN10599_F	CTACAACGGAACCGATCCTG
APN_DN10599_R	GAATCTGCTCTTCGTCCGTT
APN_DN10282_F	GAATCACCGAAGGCAGTTCT
APN_DN10282_R	AACGAATTCCTTCTCGCCTC
$\alpha$ -Am_DN7964-i1_F	TGAAACATCGAAAGCTCCAGAC
$\alpha$ -Am_DN7964-i1_R	ACACGCCGTTGGTCATGATT
$\alpha$ -Am_DN8927_F	CACAGCTCACGGATTTGCAG
$\alpha$ -Am_DN8927_R	TGCTCCCATTCCGTTGTATTCA
Li_DN10934_F	GCCCCAGTTGCATTCATGTC
Li_DN10934_R	ATTGGTCCGTACACAGCGTT
Li_DN7589_F	GAAGACGCCCTCCTAACCAC
Li_DN7589_R	GCCAAGCTCCCACAAGTAGT
Li_DN10724_F	CCCAACCCACCAGATTACC
Li_DN10724_R	GAGGCCCCACAAGAAGTCAA
Li_DN8244_F	GCCCGTAACAACGTTCCAAC
Li_DN8244_R	GCGCTGAACAATGGAAGAGC
HiRPL5_F	AGTCAGTCTTTCCCTCACGA
HiRPL5_R	GCGTCAACTCGGATGCTA

TABLE S3 Amino acid content (mg/100 g of dry weight) of s-OFMSW, modified s-OFMSW, larvae, and pupae. Essential amino acids are in bold

	s-OFMSW			modified s-OFMSW		
	Substrate	Larvae	Pupae	Substrate	Larvae	Pupae
Cysteine	161.93	133.82	132.43	110.98	136.61	132.59
Tyrosine	477.22	1717.21	2207.99	325.43	2092.49	2310.06
Glycine	682.12	1580.62	2108.37	466.26	1761.4	2202.69
Alanine	719.02	2425.39	2152.1	466.43	2527.25	2207.74
Serine	866.93	1413.74	1588.77	625.21	1540.8	1640.04
Aspartic acid/Asparagine	1427.79	2459.31	3162.33	951.36	2695.5	3056.37
Proline	1470.6	1784.63	1912.02	1052.27	1888	1981.08
Glutamic acid/Glutamine	5129.39	3785.61	4107.93	3626.69	3911.44	4112.21
<b>Tryptophan</b>	208.7	518.6	676.7	165.6	517	611.3
<b>Methionine</b>	253.58	377.58	483.96	174.13	475.04	475.34
<b>Isoleucine</b>	562.63	1087.03	1220.28	388.37	1200.62	1270.44
<b>Threonine</b>	631.76	1175.59	1335.17	435.44	1284.49	1354.66
<b>Valine</b>	753.57	1552.83	1825.71	535.42	1757.25	1913.45
<b>Histidine</b>	760.78	1133.28	1413.67	609.15	1470.39	1623.61
<b>Phenylalanine</b>	778.05	1061.36	1339.48	584.3	1280.11	1338.9
<b>Arginine</b>	785.63	1235.12	1721.8	533.92	1601.05	1742.06
<b>Lysine</b>	1016.23	1918.16	2205.96	634.59	2046.24	2124.89
<b>Leucine</b>	1357.18	2054.33	2373.86	935.43	2235.02	2384.19
Total	18043.11	27414.21	31968.53	12620.98	30420.7	32481.62

TABLE S4 Detailed relative expression values and statistic data for BSFL midgut genes involved in the digestion of proteins (trypsin- and chymotrypsin-like, aminopeptidase N-like), carbohydrate ( $\alpha$ -amylase-like), and lipid (lipase-like) in larvae grown on the two experimental diets. S = sample