

Supplemental Data for:

Joseph, C.M.L., L.W. Gorton, S.E. Ebeler, and L.F. Bisson. 2013.

Production of volatile compounds by wine strains of *Brettanomyces bruxellensis* grown in the presence of different precursor substrates.

Am. J. Enol. Vitic. 64:231-240. doi: 10.5344/ajev.2013.12095.

Supplemental Data Data are the means of three replications of each sample. Chemicals are identified with the commonly used name and the CAS number for clarity. Values are expressed as µg/mL based on the peak area of the internal standard, 2-nonanone, which was set to 1 to reflect the actual concentration of 1 µg/mL. The superscript letters indicate values that varied significantly ($p < 0.05$), based on ANOVA, in supplemented medium when compared to unsupplemented medium (^a is not significantly different, ^b is significantly different). Bold font also indicates a statistically significant change.

Strain	Supplement	Ethyl acetate 141-78-6	Butanol 71-36-3	Acetic acid 64-19-7	3-Methyl-1- butanol 123-51-3	2-Methyl-1- butanol 137-32-6	Ethyl isobutyrate 97-62-1	Isobutyric acid 79-31-2	Ethyl-2-methyl butyrate 7452-79-1
615	None	0.0235 ^a	0 ^a	0.0046 ^a	0.0071 ^a	0.0069 ^a	0 ^a	0 ^a	0 ^a
2058	None	0.0101 ^a	0 ^a	0.0371 ^a	0.0180 ^a	0 ^a	0 ^a	0 ^a	0 ^a
2077	None	0.0197 ^a	0 ^a	0 ^a	0.0060 ^a	0 ^a	0 ^a	0 ^a	0 ^a
2082	None	0.0237 ^a	0 ^a	0.0181 ^a	0.0079 ^a	0 ^a	0 ^a	0 ^a	0.0018 ^a
2091	None	0.0240 ^a	0 ^a	0.0162 ^a	0.0077 ^a	0.0072 ^a	0 ^a	0 ^a	0 ^a
615	Caffeic acid	0.0236 ^a	0 ^a	0.0080 ^a	0.0046 ^a	0.0078 ^a	0 ^a	0 ^a	0 ^a
2058	Caffeic acid	0.0185 ^a	0 ^a	0.0440 ^a	0.0255 ^a	0.0218^b	0 ^a	0 ^a	0.0025^b
2077	Caffeic acid	0.0249 ^a	0 ^a	0.0155^b	0.0161^b	0 ^a	0 ^a	0 ^a	0 ^a
2082	Caffeic acid	0.0258 ^a	0 ^a	0.0172 ^a	0.0034^b	0.0026^b	0 ^a	0 ^a	0.0041^b
2091	Caffeic acid	0.0337 ^a	0 ^a	0.0209 ^a	0.0084 ^a	0.0067 ^a	0 ^a	0 ^a	0 ^a
615	Coumaric acid	0.0356 ^a	0 ^a	0.0134^b	0.0042 ^a	0.0057 ^a	0 ^a	0 ^a	0 ^a
2058	Coumaric acid	0.0148 ^a	0 ^a	0.0238 ^a	0.0126 ^a	0.0065^b	0 ^a	0 ^a	0 ^a
2077	Coumaric acid	0.0375 ^a	0 ^a	0.0167^b	0.0128 ^a	0 ^a	0 ^a	0 ^a	0 ^a
2082	Coumaric acid	0.0291 ^a	0 ^a	0.0165 ^a	0.0030^b	0.0036^b	0 ^a	0 ^a	0.0046^b
2091	Coumaric acid	0.0289 ^a	0 ^a	0.0143 ^a	0.0066 ^a	0^b	0 ^a	0 ^a	0 ^a
615	Ferulic acid	0.0200 ^a	0 ^a	0.0067 ^a	0.0032^b	0.0058 ^a	0 ^a	0 ^a	0 ^a
2058	Ferulic acid	0.0239^b	0 ^a	0.0316 ^a	0.0182 ^a	0.0098^b	0 ^a	0 ^a	0 ^a
2077	Ferulic acid	0.0266 ^a	0 ^a	0.0154^b	0.0109	0.0056^b	0 ^a	0 ^a	0 ^a
2082	Ferulic acid	0.0134 ^a	0 ^a	0.0215 ^a	0.0067 ^a	0 ^a	0 ^a	0 ^a	0.0022 ^a
2091	Ferulic acid	0.0267 ^a	0 ^a	0.0144 ^a	0.0057 ^a	0.0049 ^a	0 ^a	0 ^a	0 ^a
615	Phenylalanine	0.0330 ^a	0 ^a	0.0091 ^a	0.0123 ^a	0.0126 ^a	0 ^a	0 ^a	0 ^a
2058	Phenylalanine	0.0259^b	0 ^a	0.0246 ^a	0.0399^b	0.0299^b	0 ^a	0 ^a	0 ^a
2077	Phenylalanine	0.0268 ^a	0 ^a	0.0089^b	0.0283^b	0.0056^b	0 ^a	0 ^a	0 ^a
2082	Phenylalanine	0.0329 ^a	0 ^a	0.0112 ^a	0.0105 ^a	0.0111^b	0 ^a	0 ^a	0.0074^b
2091	Phenylalanine	0.0237 ^a	0 ^a	0.0135 ^a	0.0288^b	0.0278^b	0.0015^b	0 ^a	0.0016^b
615	Tryptophan	0.0207 ^a	0 ^a	0.0116^b	0.0069 ^a	0.0100 ^a	0 ^a	0 ^a	0 ^a
2058	Tryptophan	0.0258^b	0 ^a	0.0277 ^a	0.0333 ^a	0.0186^b	0 ^a	0 ^a	0 ^a
2077	Tryptophan	0.0305 ^a	0 ^a	0.0109^b	0.0249^b	0.0071^b	0 ^a	0 ^a	0 ^a
2082	Tryptophan	0.0237 ^a	0 ^a	0.0160 ^a	0.0035^b	0.0037^b	0 ^a	0 ^a	0.0073^b
2091	Tryptophan	0.0254 ^a	0 ^a	0.0133 ^a	0.0082 ^a	0.0085 ^a	0 ^a	0 ^a	0.0003^b
615	Tyrosine	0.0367 ^a	0.0127^b	0^b	0.0311^b	0.0549^b	0.0055^b	0 ^a	0.0071^b
2058	Tyrosine	0.0286^b	0 ^a	0.0279 ^a	0.0620^b	0.0357^b	0.0016^b	0 ^a	0.004^b
2077	Tyrosine	0.0391 ^a	0 ^a	0.0078^b	0.0221^b	0.0073^b	0 ^a	0 ^a	0 ^a
2082	Tyrosine	0.0455 ^a	0 ^a	0.0156 ^a	0.0221^b	0.0364^b	0.0064^b	0 ^a	0.0139^b
2091	Tyrosine	0.0388 ^a	0.0024^b	0.0181 ^a	0.0276^b	0.0489^b	0.0078^b	0.0385^b	0.0075^b

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Strain	Supplement	Pentanoic acid 109-52-4	3-Methylbutanoic acid 503-74-2	2-Methylbutanoic acid 116-53-0	2-Ethyl-1-hexanol 104-76-7	Phenylacetaldehyde 122-78-1	1-Octanol 111-87-5	2-Nonanone 821-55-6	Phenethyl alcohol 60-12-8
615	None	0 ^a	0 ^a	0 ^a	0.0052 ^a	0 ^a	0 ^a	1 ^a	0 ^a
2058	None	0 ^a	0.0077 ^a	0.0250 ^a	0.0023 ^a	0 ^a	0.0025 ^a	1 ^a	0.2337 ^a
2077	None	0 ^a	0.0115 ^a	0.0025 ^a	0.0003 ^a	0 ^a	0 ^a	1 ^a	0.0101 ^a
2082	None	0 ^a	0.0043 ^a	0.0164 ^a	0 ^a	0 ^a	0 ^a	1 ^a	0.0132 ^a
2091	None	0 ^a	0.0165 ^a	0.0365 ^a	0.0034 ^a	0 ^a	0 ^a	1 ^a	0.0484 ^a
615	Caffeic acid	0 ^a	0 ^a	0 ^a	0.0069 ^a	0 ^a	0 ^a	1 ^a	0.0124^b
2058	Caffeic acid	0 ^a	0.0152 ^a	0.0335 ^a	0.0058 ^a	0 ^a	0.0034 ^a	1 ^a	0.2460 ^a
2077	Caffeic acid	0 ^a	0.0116 ^a	0 ^a	0.0040 ^a	0 ^a	0 ^a	1 ^a	0.0216^b
2082	Caffeic acid	0 ^a	0.0077 ^a	0.0124 ^a	0.0026^b	0 ^a	0 ^a	1 ^a	0.0101 ^a
2091	Caffeic acid	0.0034^b	0.0160 ^a	0.0329 ^a	0.0039 ^a	0 ^a	0 ^a	1 ^a	0.0428 ^a
615	Coumaric acid	0 ^a	0.0074^b	0 ^a	0.0004 ^a	0 ^a	0 ^a	1 ^a	0.0338^b
2058	Coumaric acid	0 ^a	0.0173^b	0.0113 ^a	0.0032 ^a	0 ^a	0^b	1 ^a	0.3018 ^a
2077	Coumaric acid	0 ^a	0.0172 ^a	0.0051 ^a	0.0051 ^a	0 ^a	0 ^a	1 ^a	0.0347^b
2082	Coumaric acid	0.0117^b	0^b	0.0146 ^a	0.0053^b	0 ^a	0 ^a	1 ^a	0.0293 ^a
2091	Coumaric acid	0 ^a	0.0210 ^a	0.0058 ^a	0.0058 ^a	0 ^a	0 ^a	1 ^a	0.0896 ^a
615	Ferulic acid	0 ^a	0.0050^b	0 ^a	0.0033 ^a	0 ^a	0 ^a	1 ^a	0.0200^b
2058	Ferulic acid	0 ^a	0.0038 ^a	0^b	0.0030 ^a	0 ^a	0^b	1 ^a	0.1750 ^a
2077	Ferulic acid	0 ^a	0.0103 ^a	0^b	0.0040 ^a	0 ^a	0 ^a	1 ^a	0.0222^b
2082	Ferulic acid	0 ^a	0.0080 ^a	0.0098 ^a	0.0031^b	0 ^a	0 ^a	1 ^a	0.0122 ^a
2091	Ferulic acid	0 ^a	0.0109 ^a	0.0136^b	0.0035 ^a	0 ^a	0 ^a	1 ^a	0.0493 ^a
615	Phenylalanine	0 ^a	0.0109^b	0.0331^b	0.0065 ^a	0 ^a	0 ^a	1 ^a	0.6903^b
2058	Phenylalanine	0 ^a	0.0113 ^a	0.0202 ^a	0.0028 ^a	0.0027^b	0^b	1 ^a	1.2754^b
2077	Phenylalanine	0 ^a	0.0175 ^a	0.0048 ^a	0.0053^b	0 ^a	0 ^a	1 ^a	0.5466^b
2082	Phenylalanine	0 ^a	0.0327^b	0.0500^b	0.0060^b	0 ^a	0 ^a	1 ^a	0.4402^b
2091	Phenylalanine	0 ^a	0.0300 ^a	0.0822^b	0.0060 ^a	0 ^a	0 ^a	1 ^a	0.6127^b
615	Tryptophan	0 ^a	0.0110^b	0.0100^b	0.0028 ^a	0 ^a	0 ^a	1 ^a	0.0822^b
2058	Tryptophan	0 ^a	0.0161^b	0.0195 ^a	0.0029 ^a	0.0021^b	0.0026 ^a	1 ^a	0.3322 ^a
2077	Tryptophan	0 ^a	0.0331^b	0.0060 ^a	0.0039 ^a	0 ^a	0 ^a	1 ^a	0.0973^b
2082	Tryptophan	0 ^a	0.0278^b	0.0405^b	0.0023^b	0 ^a	0 ^a	1 ^a	0.0239 ^a
2091	Tryptophan	0 ^a	0.0415^b	0.0889^b	0.0039 ^a	0 ^a	0 ^a	1 ^a	0.1368^b
615	Tyrosine	0 ^a	0.0691^b	0.1099^b	0.0130 ^a	0 ^a	0.0033^b	1 ^a	0.1234^b
2058	Tyrosine	0 ^a	0.0672^b	0.0737^b	0.0083^b	0.0029^b	0.0048 ^a	1 ^a	0.6667^b
2077	Tyrosine	0 ^a	0.0230 ^a	0.0070^b	0.0047^b	0 ^a	0 ^a	1 ^a	0.0277^b
2082	Tyrosine	0 ^a	0.0545^b	0.1550^b	0.0068^b	0 ^a	0 ^a	1 ^a	0.1168^b
2091	Tyrosine	0 ^a	0.1011^b	0.2448^b	0.0054 ^a	0 ^a	0 ^a	1 ^a	0.1491^b

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Strain	Supplement	Octanoic acid 124-07-2	4-Ethylphenol 123-07-9	Ethyl octanoate 106-32-1	Phenethyl propionate 103-52-6	Phenethyl acetate 103-45-7	1-Decanol 112-30-1	4-Ethylguaiacol 2785-89-9I
615	None	0.0677 ^a	0 ^a	0.1139 ^a	0 ^a	0 ^a	0.0052 ^a	0 ^a
2058	None	0.0432 ^a	0 ^a	0.0860 ^a	0.0024 ^a	0 ^a	0 ^a	0 ^a
2077	None	0.0427 ^a	0 ^a	0.0653 ^a	0 ^a	0 ^a	0.0041 ^a	0 ^a
2082	None	0.0293 ^a	0 ^a	0.1399 ^a	0 ^a	0 ^a	0 ^a	0 ^a
2091	None	0.0195 ^a	0 ^a	0.0301 ^a	0 ^a	0 ^a	0 ^a	0 ^a
615	Caffeic acid	0.0419 ^a	0 ^a	0.2057 ^a	0 ^a	0 ^a	0.0036 ^a	0.0118^b
2058	Caffeic acid	0.0685 ^a	0 ^a	0.1691 ^a	0.0041 ^a	0 ^a	0.0040^b	0.0207^b
2077	Caffeic acid	0.0410 ^a	0 ^a	0.0661 ^a	0 ^a	0 ^a	0.0054 ^a	0.0164^b
2082	Caffeic acid	0.0218 ^a	0 ^a	0.1597 ^a	0 ^a	0 ^a	0 ^a	0.0111^b
2091	Caffeic acid	0.0205 ^a	0 ^a	0.0596 ^a	0 ^a	0 ^a	0 ^a	0.0138^b
615	Coumaric acid	0^b	3.1503^b	0.1980 ^a	0 ^a	0 ^a	0.0028 ^a	0 ^a
2058	Coumaric acid	0.0793 ^a	2.8766^b	0.1646 ^a	0^b	0.0045^b	0.0028^b	0 ^a
2077	Coumaric acid	0.1011^b	3.0865^b	0.0909 ^a	0 ^a	0 ^a	0.0089 ^a	0 ^a
2082	Coumaric acid	0.0745^b	3.0882^b	0.2370 ^a	0 ^a	0 ^a	0 ^a	0 ^a
2091	Coumaric acid	0.0750^b	3.2907^b	0^b	0 ^a	0 ^a	0.0032^b	0 ^a
615	Ferulic acid	0.0589 ^a	0 ^a	0.1728 ^a	0 ^a	0 ^a	0.0045 ^a	5.0503^b
2058	Ferulic acid	0.0435 ^a	0 ^a	0.1159 ^a	0^b	0.0025^b	0.0029^b	4.2126^b
2077	Ferulic acid	0.0372 ^a	0 ^a	0.0817 ^a	0 ^a	0 ^a	0.0067 ^a	4.4811^b
2082	Ferulic acid	0.0299 ^a	0 ^a	0.1441 ^a	0 ^a	0 ^a	0.0013^b	4.2989^b
2091	Ferulic acid	0.0166 ^a	0 ^a	0.0319 ^a	0 ^a	0 ^a	0.0021^b	4.2980^b
615	Phenylalanine	0.0395 ^a	0 ^a	0.1398 ^a	0 ^a	0.0440^b	0.0042 ^a	0 ^a
2058	Phenylalanine	0.0239 ^a	0 ^a	0.0754 ^a	0^b	0.0401^b	0 ^a	0 ^a
2077	Phenylalanine	0.0370 ^a	0 ^a	0.057 ^a	0 ^a	0.0290^b	0.0054 ^a	0 ^a
2082	Phenylalanine	0.0287 ^a	0 ^a	0.1287 ^a	0 ^a	0.0724^b	0 ^a	0 ^a
2091	Phenylalanine	0^b	0 ^a	0.0299 ^a	0 ^a	0.0041^b	0 ^a	0 ^a
615	Tryptophan	0.0518 ^a	0 ^a	0.1943^b	0 ^a	0 ^a	0^b	0 ^a
2058	Tryptophan	0.0434 ^a	0 ^a	0.1133^b	0.0038 ^a	0 ^a	0 ^a	0 ^a
2077	Tryptophan	0.0327 ^a	0 ^a	0.0810^b	0 ^a	0 ^a	0.0052 ^a	0 ^a
2082	Tryptophan	0.0358 ^a	0 ^a	0.1377 ^a	0 ^a	0.0091^b	0 ^a	0 ^a
2091	Tryptophan	0.0109 ^a	0 ^a	0.0341 ^a	0 ^a	0.0113^b	0 ^a	0 ^a
615	Tyrosine	0.0649 ^a	0 ^a	0.2144 ^a	0 ^a	0.0098^b	0^b	0 ^a
2058	Tyrosine	0.0290 ^a	0 ^a	0.0690 ^a	0^b	0.0336^b	0.0049^b	0 ^a
2077	Tyrosine	0.0391 ^a	0 ^a	0.0507 ^a	0 ^a	0.0052^b	0.0059 ^a	0 ^a
2082	Tyrosine	0.0700^b	0 ^a	0.2510 ^a	0 ^a	0 ^a	0.0026^b	0 ^a
2091	Tyrosine	0.0129 ^a	0 ^a	0.0580 ^a	0 ^a	0.0091^b	0.0023^b	0 ^a

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Strain	Supplement	Decanoic acid 334-48-5	Ethyl decanoate 101-38-3	β -Farnesene 18794-84-8	Ethyl octanoate 106-32-1	Ethyl dodecanoate 106-33-2	Ethyl tetradecanoate 124-06-1	Ethyl 9-hexadecenoate*	Ethyl hexadecanoate 628-97-7
615	None	0.0746 ^a	0.1821 ^a	0 ^a	0 ^a	0.0322 ^a	0 ^a	0 ^a	0.0080 ^a
2058	None	0.0117 ^a	0.0952 ^a	0.0015 ^a	0 ^a	0.0358 ^a	0.0017 ^a	0.0031 ^a	0.0022 ^a
2077	None	0.0590 ^a	0.2218 ^a	0 ^a	0 ^a	0.0577 ^a	0 ^a	0.0036 ^a	0.0027 ^a
2082	None	0.0210 ^a	0.1919 ^a	0 ^a	0 ^a	0.2067 ^a	0.0201 ^a	0.0165 ^a	0.0217 ^a
2091	None	0.0069 ^a	0.0857 ^a	0 ^a	0 ^a	0.0316 ^a	0 ^a	0.0030 ^a	0.0039 ^a
615	Caffeic acid	0.0485 ^a	0.3424 ^a	0 ^a	0 ^a	0.1420^b	0.0071^b	0.0144^b	0.0204 ^a
2058	Caffeic acid	0.0263 ^a	0.2015 ^a	0.0021 ^a	0 ^a	0.0908^b	0.0046^b	0.0068 ^a	0.0057 ^a
2077	Caffeic acid	0.0638 ^a	0.1967 ^a	0 ^a	0 ^a	0.0955 ^a	0.0043^b	0.0086^b	0.0053 ^a
2082	Caffeic acid	0.0208 ^a	0.2242 ^a	0 ^a	0.0019^b	0.2637 ^a	0.0216 ^a	0.0195 ^a	0.0027 ^a
2091	Caffeic acid	0.0122 ^a	0.1397 ^a	0 ^a	0 ^a	0.0584 ^a	0.0018^b	0.0051 ^a	0.0081 ^a
615	Coumaric acid	0.0556 ^a	0.3397 ^a	0 ^a	0 ^a	0.1679^b	0.0109^b	0.0183^b	0.0260^b
2058	Coumaric acid	0.0400^b	0.2432^b	0.0023 ^a	0 ^a	0.1533^b	0.0069^b	0.0083^b	0.0109^b
2077	Coumaric acid	0.1422^b	0.3006 ^a	0 ^a	0 ^a	0.2103^b	0.0071^b	0.0110^b	0.0067^b
2082	Coumaric acid	0.0582^b	0.4094^b	0 ^a	0 ^a	0.5247^b	0.0396 ^a	0.0047^b	0.0429 ^a
2091	Coumaric acid	0.0615^b	0.237^b	0 ^a	0 ^a	0.1834^b	0.0042^b	0.0078 ^a	0.0102^b
615	Ferulic acid	0.0438 ^a	0.2886 ^a	0 ^a	0 ^a	0.0894^b	0.0023^b	0.0025^b	0.0470^b
2058	Ferulic acid	0.0157 ^a	0.1531 ^a	0.002 ^a	0 ^a	0.0647 ^a	0.0021 ^a	0.0023 ^a	0.0043 ^a
2077	Ferulic acid	0.0381 ^a	0.2247 ^a	0 ^a	0 ^a	0.0895 ^a	0.0052^b	0.0052 ^a	0.0085^b
2082	Ferulic acid	0.0119 ^a	0.1833 ^a	0 ^a	0.0013^b	0.1838 ^a	0.0204 ^a	0.0175 ^a	0.0390 ^a
2091	Ferulic acid	0^b	0.0900 ^a	0 ^a	0 ^a	0.0282 ^a	0 ^a	0 ^a	0.0034 ^a
615	Phenylalanine	0.0140^b	0.2404 ^a	0.0017^b	0 ^a	0.0929^b	0.0035^b	0.0008^b	0.0046 ^a
2058	Phenylalanine	0^b	0.1016 ^a	0.0021 ^a	0 ^a	0.0556 ^a	0^b	0^b	0.0028 ^a
2077	Phenylalanine	0.0530 ^a	0.1978 ^a	0 ^a	0 ^a	0.0966 ^a	0.0042^b	0.0108^b	0.0085^b
2082	Phenylalanine	0.0188 ^a	0.2349 ^a	0 ^a	0.0013^b	0.1270 ^a	0.0042^b	0.0016^b	0.0245 ^a
2091	Phenylalanine	0^b	0.0907 ^a	0 ^a	0 ^a	0.0142^b	0 ^a	0^b	0^b
615	Tryptophan	0.0281^b	0.2428 ^a	0 ^a	0 ^a	0.0712^b	0.0032^b	0.0011^b	0.0073 ^a
2058	Tryptophan	0^b	0.1221 ^a	0.0021 ^a	0 ^a	0.0475 ^a	0^b	0.0014 ^a	0.0033 ^a
2077	Tryptophan	0.0188^b	0.2076 ^a	0 ^a	0 ^a	0.0764 ^a	0.0051^b	0.0119^b	0.0102^b
2082	Tryptophan	0.0113 ^a	0.1794 ^a	0 ^a	0 ^a	0.1914 ^a	0.0225 ^a	0.0266 ^a	0.0357 ^a
2091	Tryptophan	0^b	0.0836 ^a	0 ^a	0 ^a	0.0191 ^a	0 ^a	0.0014 ^a	0.0043 ^a
615	Tyrosine	0.0133^b	0.2530 ^a	0 ^a	0 ^a	0.0772^b	0.0038^b	0.0066^b	0.0206^b
2058	Tyrosine	0.0210^b	0.2461^b	0.0034 ^a	0 ^a	0.1080^b	0^b	0.0015 ^a	0.0083^b
2077	Tyrosine	0.0531 ^a	0.1578 ^a	0 ^a	0 ^a	0.0036^b	0 ^a	0.0028 ^a	0.0030 ^a
2082	Tyrosine	0.0666^b	0.3369 ^a	0 ^a	0.0028^b	0.1712 ^a	0.0058^b	0.0039^b	0^b
2091	Tyrosine	0^b	0.1583 ^a	0 ^a	0 ^a	0.0302 ^a	0 ^a	0^b	0^b

*CAS number and standard not available.