

SUPPLEMENTARY DATA

Table S1 - Australian red wines made from emerging and major wine grape varieties evaluated by the expert and trained RATA panel.

Code	Vintage	Variety	Region
MON1*	2018	Montepulciano	Barossa Valley
MON2	2018	Montepulciano	Barossa Valley
MON3	2018	Montepulciano	Limestone Coast
MON4	2019	Montepulciano	McLaren Vale
MON5	2018	Montepulciano	McLaren Vale
MON6	2019	Montepulciano	Barossa Valley
MON7	2020	Montepulciano	McLaren Vale
MON8*	2019	Montepulciano	Barossa Valley
MON9	2020	Montepulciano	McLaren Vale
MON10	2020	Montepulciano	Riverland
NERO1	2018	Nero d'Avola	Barossa Valley
NERO2	2018	Nero d'Avola	Adelaide Hills
NERO3	2019	Nero d'Avola	Adelaide Hills
NERO4	2020	Nero d'Avola	McLaren Vale
NERO5*	2020	Nero d'Avola	McLaren Vale
NERO6	2019	Nero d'Avola	McLaren Vale
NERO7	2018	Nero d'Avola	McLaren Vale
NERO8*	2020	Nero d'Avola	Barossa Valley
NERO9	2020	Nero d'Avola	Riverland
NERO10	2017	Nero d'Avola	McLaren Vale
TOUR1	2019	Touriga Nacional	Barossa Valley
TOUR2	2019	Touriga Nacional	McLaren Vale
TOUR3	2017	Touriga Nacional	Barossa Valley
TOUR4	2018	Touriga Nacional	Langhorne Creek
TOUR5	2019	Touriga Nacional	McLaren Vale
TOUR6*	2018	Touriga Nacional	Langhorne Creek
TOUR7	2017	Touriga Nacional	Riverland
TOUR8*	2020	Touriga Nacional	Riverland
TOUR9	2020	Touriga Nacional	Waite
SHZ1	2017	Shiraz	Clare Valley
SHZ2	2019	Shiraz	Barossa Valley
SHZ3*	2019	Shiraz	Barossa Valley
CABS1	2019	Cabernet Sauvignon	Margaret River
CABS2	2018	Cabernet Sauvignon	Coonawarra
CABS3*	2018	Cabernet Sauvignon	Clare Valley
GREN1*	2020	Grenache	McLaren Vale
GREN2	2020	Grenache	McLaren Vale
GREN3	2021	Grenache	McLaren Vale

*Wines used in consumer acceptance trials.

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Table S2 – Basic chemical analyses of the 38 red wine samples

Wine Sample	pH	TA (g/L)	Residual Sugar (g/L)	Acetic Acids (g/L)	% ABV	Free SO ₂ (ppm)	Total SO ₂ (ppm)	Density (g/cm ³)	Hue	Colour Intensity
MON1	3.36	5.41	0.49	0.54	14.11	5.26	54.55	0.99144	0.524	0.683
MON2	3.45	4.66	0.64	0.55	14.58	0.00	45.23	0.99083	0.504	0.961
MON3	3.39	4.60	0.50	0.35	12.18	0	16.64	0.99183	0.563	0.548
MON4	3.37	5.23	0.37	0.53	14.21	4.62	29.96	0.99173	0.422	0.046
MON5	3.40	4.93	0.54	0.52	14.22	0	53.24	0.99104	0.518	0.793
MON6	3.18	5.38	0.40	0.38	14.01	0	39.52	0.99185	0.499	0.842
MON7	3.52	5.26	0.20	0.47	12.47	1.27	14.43	0.99274	0.405	1.097
MON8	3.47	5.11	0.39	0.53	14.86	1.73	80.53	0.99096	0.431	1.129
MON9	3.74	4.90	0.49	0.38	14.10	12.87	57.16	0.99234	0.373	1.609
MON10	3.60	5.30	0.47	0.47	15.34	14.08	55.69	0.99146	0.399	1.189
NERO1	3.33	5.53	0.78	0.47	13.74	8.01	38.78	0.99133	0.552	0.527
NERO2	3.37	5.72	0.59	0.45	14.17	7.72	60.76	0.99099	0.507	0.575
NERO3	3.19	5.78	0.39	0.59	14.40	11.66	42.70	0.98982	0.521	0.392
NERO4	3.56	5.36	0.43	0.43	13.97	2.75	38.21	0.99136	0.381	0.894
NERO5	3.57	4.94	0.35	0.25	14.03	19.32	45.15	0.99034	0.380	0.791
NERO6	3.38	6.08	0.65	0.49	14.73	12.03	64.84	0.99162	0.476	0.748
NERO7	3.50	5.35	0.66	0.45	13.93	0.95	37.55	0.99119	0.606	0.549
NERO8	3.31	6.96	0.23	0.59	13.77	5.45	50.22	0.99140	0.397	0.824
NERO9	3.55	5.72	0.85	0.07	15.38	14.18	46.71	0.98995	0.385	0.778
NERO10	3.51	5.89	1.22	0.59	14.30	13.48	111.33	0.99293	0.685	0.433
TOUR1	3.51	5.70	0.77	0.59	14.88	1.66	86.17	0.99172	0.505	0.990
TOUR2	3.72	5.11	0.03	0.55	14.14	0	55.45	0.99238	0.444	1.056
TOUR3	4.05	5.11	0.03	0.46	14.51	0	79.88	0.99114	0.560	0.821
TOUR4	3.99	4.69	0.64	0.47	15.30	0	48.09	0.99158	0.458	1.055
TOUR5	3.59	5.63	0.43	0.39	13.78	0	36.66	0.99223	0.457	1.011
TOUR6	3.50	5.62	0.84	0.59	15.80	2.73	88.21	0.99080	0.505	0.828
TOUR7	3.42	6.93	0.95	0.55	16.13	0	11.74	0.99142	0.755	0.611
TOUR8	3.56	5.10	0.35	0.41	14.95	6.45	84.21	0.99052	0.412	0.717
TOUR9	3.35	6.37	0.07	0.59	13.82	12.21	134.29	0.99208	0.360	1.164
SHZ1	3.46	5.28	0.65	0.43	14.01	1.88	25.30	0.99212	0.586	0.727
SHZ2	3.65	5.30	0.48	0.44	14.63	11.71	48.91	0.99205	0.400	1.208
SHZ3	3.60	5.31	3.29	0.35	14.62	10.47	79.79	0.99361	0.402	1.145
CABS1	3.48	5.69	0.22	0.28	14.17	9.68	95.15	0.99185	0.378	1.193
CABS2	3.63	5.36	0.45	0.57	14.04	0.73	71.62	0.99260	0.461	1.008
CABS3	3.44	5.64	0.97	0.36	14.04	11.44	51.20	0.99247	0.447	0.935
GREN1	3.48	5.12	1.96	0.36	15.05	5.43	32.41	0.99052	0.515	0.350
GREN2	3.52	5.12	0.24	0.46	14.27	5.94	35.45	0.99017	0.394	0.528
GREN3	3.60	5.14	0.33	0.26	14.21	5.53	6.92	0.98974	0.364	0.392

Values are means of duplicate measurements.

Table S3 – Sensory attributes, including aroma, flavour, taste and mouthfeel used by both the wine expert panel and trained RATA panel to characterise the red wine samples.

Aroma/Flavour attributes	Description
Dark Fruit	Blackberry, Mulberry, Plum, Dark Cherry, Forrest Fruits
Red Fruit	Strawberry, Raspberry, Red Cherry, Boysenberry
Dried Fruit	Prunes, Raisins, Fig
Confectionery	Confectionery
Jammy	Preserved or cooked fruit
Marmalade	Marmalade
Red floral	Rose, Hibiscus
Blue Floral	Violet, Lavender
Spices	Anise, Clove, Cinnamon, Liquorice, Nutmeg
Green	Green Pepper, Capsicum, Green Bean
Herbaceous	Stemmy, Stalky, Tomato Leaf
Vegetal	Cut Grass, Hay
Dried Herbs	Oregano
Mint	Spearmint, Peppermint
Pepper	Black or White pepper
Eucalypt	Eucalypt
Savoury	Meaty, Soy Sauce, Black Olive, Salami
Nutty	Nutty
Tea	Black Tea Leaves
Cooked Vegetables	Reductive, Sulphide
Barnyard	Horsey
Earthy	Mushroom, Truffle, Forest Floor
Tobacco	Smoky, Cigar
Leather	Leather
Chocolate	Chocolate
Caramel	Butterscotch
Oaky	Woody, Pencil Shavings, Toast, Cedar, Coconut
Sweet Oak	Vanilla
Plum Brandy	Plum Brandy
Taste attributes	
Bitter	
Sweet	
Sour	
Mouthfeel attributes	
Smooth	
Rough	
Viscous	
Body	
Alcohol/Heat	
Astringency/Roughing/Drying	
Puckering/Grippy	
Flavour Length	

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Table S4 - Mean hedonic responses of the trained RATA panel (n = 36) for 35 emerging and traditional red wines.

Wine	Hedonic Response
TOUR8	6.47 _a
TOUR6	6.45 _{ab}
NERO1	6.39 _{abc}
TOUR1	6.36 _{abcd}
GREN1	6.28 _{abcde}
TOUR9	6.25 _{abcdef}
MON4	6.22 _{abcdef}
TOUR5	6.20 _{abcdefg}
NERO8	6.17 _{abcdefgh}
NERO4	6.14 _{abcdefghi}
NERO9	6.08 _{abcdefghij}
NERO5	6.06 _{abcdefghij}
NERO3	5.97 _{abcdefghijk}
MON10	5.95 _{abcdefghijk}
MON1	5.89 _{abcdefghijk}
NERO2	5.89 _{abcdefghijk}
CABS3	5.86 _{abcdefghijkl}
GREN2	5.81 _{abcdefghijkl}
NERO7	5.75 _{bcdefghijkl}
MON5	5.72 _{cdefghijkl}
MON6	5.70 _{cdefghijkl}
CABS2	5.67 _{defghijkl}
MON3	5.67 _{defghijkl}
SHZ3	5.64 _{efghijkl}
SHZ1	5.61 _{efghijkl}
NERO6	5.56 _{efghijklm}
MON8	5.50 _{ghijklm}
CABS1	5.47 _{hijklm}
SHZ2	5.45 _{ijklm}
NERO10	5.42 _{jklm}
TOUR4	5.39 _{jklm}
MON9	5.28 _{klm}
TOUR3	5.28 _{klm}
TOUR7	5.17 _{lm}
MON2	4.89 _m

One-way ANOVA and Fishers LSD ($P < 0.05$). Mean liking scores of wines sharing letters are not significantly different.

Table S5 – Demographic information from the Australian Red Wine Consumers panellists including the Fine Wine Instrument segmentation and chi-square results in bold with Fisher exact test as post-hoc test ($\alpha \leq 0.05$).^{a,b}

Demographic information	Wine Enthusiasts (n = 56)	Aspirants (n = 42)	No Frills (n = 18)	Total % (n = 116)
Gender				
Female	28	25	11	55.2
Male	27	17	7	44.0
Other	1	0	0	0.9
Age				
18 to 34 years old	9a	7a	10b	22.4
35 to 54 years old	17	9	5	26.7
55+ years old	30a	26a	3b	50.8
Education				
No Tertiary	10	11	3	20.7
Bachelor's Degree	12a	12a	10b	29.3
Post Grad Degree	34a	19ab	5b	50
Household Income				
Under \$50,000	8	5	4	14.7
\$50K - \$99,999	17	16	5	32.8
\$100K - \$199,999	26	16	8	43.1
\$200K+	5	5	1	9.5
Frequency of Wine Consumption				
< once a month	1a	0a	4b	4.3
Once a month	0a	1a	4b	4.3
Once a fortnight	4	7	1	10.3
Once a week	14	7	6	23.3
A few times a week	34a	22a	3b	50.9
Daily	3	5	0	6.9
Average cost of wine purchased				
\$50-\$99	1	0	0	0.9
\$26-\$49	21a	11ab	2b	29.3
\$16-\$25	29	24	13	56.9
\$15 or less	5	7	3	12.9

^a numbers that share the same letter within a row are not statistically significant according to chi-square test.

^b numbers in red have a count higher than expected and numbers in blue have a count lower than expected.

Figure S6 – PCA bi-plot of the 1st and 2nd dimensions, showcasing the significant aroma and flavour attributes used to profile the 35 wines that were assessed by trained RATA panellists (n=36) in the sorting trial. PCA overlaid with basic chemistry data to reinforce robustness of sensory data

