Australian Wine Research Institute

Fact Sheet

WINEMAKING

How to calculate wine energy values for wine exported to the European Union

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Introduction

The European union (EU) has introduced new laws that require wines produced after 8 December 2023 to display an energy value on-label. This fact sheet outlines steps to calculate the energy value required for the EU market. The new EU laws stipulate that the energy value can be calculated from the known energy values of the ingredients/constituents or calculated from generally established and accepted data. The relevant conversion factors are mandated by article 31 of EU Regulation 1169/2011 and set out in Annex XIV of EU Regulation 1169/2011. Note that conversion factors for EU energy value can differ from those for the Australian domestic market and US market.

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Components of wine that contribute to the EU energy value

The alcohol, sugar, glycerol and organic acid content of wine contribute to the EU energy value. No consideration of the protein, fat, salatrims or fibre content is needed for the purpose of wine energy calculations. These components are not typically present in wine or are present at concentrations that do not significantly affect the total energy value (Wilkes 2023). The energy conversion factors from [Annex XIV of EU Regulation 1169/2011] are reproduced in Table 1. Relevant constituents for the purpose of calculating the EU energy value appear in bold.

Table 1. Conversion factors from European regulations for use in energy calculations.

Constituent	kJ/g	kcal/g
Alcohol (ethanol)	29	7
Carbohydrate (sugars) (except polyols)	17	4
Polyols (includes glycerol)	10	2.4
Organic acids	13	3
Protein	17	4
Fat	37	9
Salatrims	25	6
Fibre	8	2
Erythritol	0	0

AWRI survey data of glycerol and organic acid concentrations in typical Australian wines suggests that the normal variation of these constituents does not significantly change the total energy value. The use of standard values for the energy contribution of glycerol and organic acids in red or white wine is therefore likely to be appropriate.

Calculating wine energy values for the EU market

Individual energy contributions from each are added together for the total EU energy value. Note that 4.18 kJ is equal to 1 kcal.

Alcohol
The measured alcohol concentration by volume (% v/v) must first be converted to percentage by weight (% w/v). This is performed by multiplying by the density of ethanol, 0.789 kg/L. The result is equivalent to grams of ethanol per 100 mL of wine, which can be multiplied by the energy conversion factors (Table 1) to determine the kJ per 100 mL of wine. To simplify, the energy contribution from alcohol (% v/v) can therefore be obtained by multiplying by a factor of 23 to obtain the kJ per 100 mL of wine.

Carbohydrate (sugars)
Sugar results from either enzymatic or reducing sugars methods can be used for this calculation, as small differences due to the analysis method do not make a practical difference when calculating the EU energy values. Sugar concentrations in wine are expressed in g/L. Before multiplying by the energy conversion factors (Table 1), the g/L is divided by 10 to express as grams per 100 mL of wine.

Polyols (includes glycerol)
It is reasonable to assume a standard glycerol concentration of 10 g/L for all red wines and 5 g/L for all white wines, based on established AWRI survey data (Wilkes 2021). For red wines, the energy contribution from glycerol per 100 mL of wine can assumed to be 10 kJ. For white wines, the energy contribution from glycerol can assumed to be 5 kJ.

Organic acids
It is reasonable to assume a standard organic acids concentration of 6 g/L for both red and white wines, based on established AWRI survey data (Wilkes 2021). The energy contribution from organic acids can be assumed to be 8 kJ per 100 mL of wine.

Commercial wine laboratories including Affinity Labs also offer determination of energy values as an analytical service.

Formulas

Formulas to calculate the EU energy values for typical Australian wines can be simplified to:

EU energy value in kJ/100 mL
Red wine EU energy value (kJ/100 mL) = (alcohol % (v/v) x 23) + (sugar g/L x 1.7) + 8* + 10*

White wine EU energy value (kJ/100 mL) = (alcohol % (v/v) x 23) + (sugar g/L x 1.7) + 8* + 5*

EU energy value in kcal/100 mL
kJ/100 mL ÷ 4.18 = kcal/100 mL.

*Standard energy values for organic acids and glycerol, for red and white wine, derived from AWRI survey data.

Example calculation

A red wine is determined through laboratory analysis to have an alcohol concentration of 14% (v/v) and a sugar concentration of 12 g/L.

EU energy value in kJ/100 mL
Red wine EU energy value (kJ/100 mL) = (Alcohol % (v/v) x 23) + (sugar g/L x 1.7) + 8 + 10
= (14 x 23) + (12 x 1.7) + 8 + 10
= 360 kJ/100mL

EU energy value in kcal/100 mL
kJ/100 mL ÷ 4.18 = kcal/100 mL
360 kJ/100 mL ÷ 4.18 = 86 kcal/100 mL

Format of EU energy value

Energy values can be denoted by the symbol 'E' and must be expressed as kilojoules (kJ) and kilocalories (kcal) per 100 mL of wine, in that order. The energy value must appear on the wine label in clear text where the 'x-height' is 1.2 mm or greater.

References and resources

Wilkes, E. 2023. Typical values for fats, proteins and salt in Australian wine for nutritional labelling. *AWRI Tech. Rev.* 266.

Wilkes, E. 2021. Impact of wine components on energy label calculations. *AWRI Tech. Rev.* 253.

Wine Australia. EU nutrition and ingredient labelling webinar (29 August 2023). Available from: https://www.wineaustralia.com/whats-happening/events/eu-nutrition-labelling-webinar

Wine Australia. Compulsory energy, nutrition and ingredient labelling in the European Union from December 2023. Wine Australia guidance document for exporters.

Contact

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Technical notes

Style-based energy content categories in Australian wine

As discussed in the August 2021 issue of *Technical Review* (Wilkes 2021), there is increasing momentum towards including the dietary energy content on labels of alcohol-containing beverages, including wine. The earlier article presented data showing that calculations of energy content for wine can reasonably be made based on measured concentrations of alcohol and sugar combined with generic values for glycerol and organic acids. The contribution of other wine components does not add substantively to the dietary energy content and can therefore be left out without compromising the accuracy of information for consumers.

Even this simplification, however, leads to a requirement for an energy value to be calculated for each wine vintage or batch and printed on the label. It could be argued that this adds significant effort, complication and cost without any real value to the consumer, as the energy differences between wines of a similar style tend to be relatively insignificant. Indeed, having a range of values on wine labels could possibly lead to misconceptions among consumers as to relative impact of different wines on dietary choices. In a number of Australia's export markets, the approach taken has been to accept a label value tolerance and to assign generic values for energy content based on wine style. This article outlines how such an approach could work for Australian wines, using sugar-based wine styles and energy calculations based on typical analytical values observed for Australian wines.

Classifying wines into style groupings for energy calculations

The most logical approach to grouping wines for energy calculations appears to be to use the relatively well understood stylistic categories of dry, semi-dry, semi-sweet and sweet. This also has the advantage of grouping the wines based on one of the core inputs for the energy calculation, namely the sugar content. Categorising wines based on variety or wine show style classifications was also considered (data not shown) but this resulted in a relatively complicated and confusing range of values, unlikely to result in an easily understood classification for consumers and industry. The sugar content-based approach gives eight categories for still wine, as shown in Table 1.

Table 1 also presents some summary statistics for sugar and alcohol content, based on almost 10,000 commercial wines submitted to AWRI Commercial Services for analysis between 2017 and 2020. It is interesting to note that 91% of red wines and 74% of whites analysed fall into the dry wine category. Less than 1% of red wines and 8% of white wines make up the semi-sweet and sweet categories. Given the size of the data set, this can be considered likely to represent the proportions of wine in each category produced in Australia.

Table 1. Typical sugar and alcohol values for wine styles categorised by sugar content. Data sourced from the AWRI Commercial Services database for finished wines submitted for analysis between 2017 and 2020. Sugar levels are measured as glucose + fructose.

	Sugar range (g/L)	n	1st quartile sugar (g/L)	median sugar (g/L)	3rd quartile sugar (g/L)	1st quartile alcohol (v/v)	median alcohol (v/v)	3rd quartile alcohol (v/v)
Dry red	0 to 4.0	5895	1.0	1.0	1.4	14.3%	14.3%	14.8%
Semi-dry red	4.1 to 12.0	523	4.8	5.7	7.1	13.4%	13.8%	14.0%
Semi-sweet red	12.1 to 45.0	35	13.7	17.2	35.1	13.4%	13.6%	13.9%
Sweet red	> 45.0	16	79.3	94.0	106.4	8.6%	9.0%	12.7%
Dry white	0 to 4.0	2328	0.8	1.5	2.4	12.0%	12.6%	13.1%
Semi-dry white	4.1 to 12.0	577	4.6	5.5	7.0	11.6%	12.3%	12.8%
Semi-sweet white	12.1 to 45.0	81	16.7	24.4	31.7	9.4%	10.3%	11.3%
Sweet white	> 45	162	79.0	102.0	154.0	7.2%	8.9%	11.1%

Calculating typical energy content for the different styles

The values in this table, in conjunction with the generic values for organic acids and glycerol from Wilkes (2021), can be used to calculate typical dietary energy content for each category, using the following formula and energy density factors from the Australia New Zealand Food Standards Code:

kJ/100 mL = (alcohol (% v/v) × 0.78924 × 29) + (sugar (g/L)/10 × 17) + generic acid contribution + generic glycerol contribution.

For red wine this gives:

kJ/100 mL = alcohol × 23 + sugar × 1.7 + 8 + 17

and for white wines:

kJ/100 mL = alcohol × 23 + sugar × 1.7 + 8 + 10

Based on this calculation, for most Australian wines with sugar content < 12 g/L, alcohol represents at least 86% of the dietary energy content, and generally quite a bit more. Energy content values for the different wine categories, calculated based on their median levels of alcohol and sugar, are summarised in Table 2, along with the change in energy content observed if 3rd quartile values are substituted for either sugar or alcohol.

Table 2. Typical dietary energy content of different wine styles based on median levels of alcohol and sugar and generic values for organic acids and glycerol (Wilkes 2021) and the percentage change in energy content if 3rd quartile values are used in the calculation instead of median values

	Sugar range (g/L)	Energy content (kJ/100 mL)	Change in energy content using 3rd quartile value for sugar	Change in energy content using 3rd quartile value for alcohol
Dry red	0 to 4.0	354	0%	3%
Semi-dry red	4.1 to 12.0	351	1%	1%
Semi-sweet red	12.1 to 45.0	366	8%	2%
Sweet red	> 45.0	391	5%	22%
Dry white	0 to 4.0	309	0%	4%
Semi-dry white	4.1 to 12.0	309	1%	4%
Semi-sweet white	12.1 to 45.0	295	4%	8%
Sweet white	> 45.0	395	22%	13%

As can be seen from Table 2, substituting the higher 3rd quartile values for sugar or alcohol into the calculation rather than the median leads to variations of 8% or less in dietary energy content for red and white wines in the dry, semi-dry and semi-sweet categories. This is significantly lower than the 20% label tolerance prescribed in several regulatory environments overseas and supports the use of generic values for these categories of wine. For the sweet categories, however, variations as high as 22% are seen when 3rd quartile values are substituted; as such, the approach of using generic values for these styles is more difficult to justify. While the sample set for these wines is much smaller than that for the dry and semi-dry categories it is generally accepted that a much wider range of sugar and alcohol values is seen in the sweet wine category (both red and white). As such, it is recommended that dietary energy content be calculated independently for sweet wines to ensure that accurate information is communicated to consumers.

Recommendations

Based on the data presented, it appears to be practical to label the vast majority of Australian wines (>98%) for dietary energy content using generic values for six major classes of wine, namely dry, semi-dry and semi-sweet red and white wines. This approach will give results within acceptable label tolerances. It also makes it easier to communicate information to consumers; for example, through webpages and apps. At the same time, it eases the burden on producers by avoiding the need for specialised chemical analysis and multiple label variations.

Across the sweet wines category (> 45.0 g/L glucose + fructose), however, variation in sugar and alcohol content is too high for this approach to provide useful information. Calculations of dietary energy content for products in this category will need to be based on individual measurement of sugar and alcohol, combined with generic values for glycerol and organic acids.

References

Australia New Zealand Food Standards Code – Schedule 11 – Calculation of values for nutrition information panel. Available from: https://www.legislation.gov.au/Details/F2021C00610

Wilkes, E. 2021. Impact of wine components on energy label calculations. AWRI Technical Review 253: 7–13. Available from: https://www.awri.com.au/information_services/publications/technical-review-technical-notes/impact-of-wine-components-on-energy-label-calculations/

Acknowledgements

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Impact of wine components on energy label calculations

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Introduction

There is increasing demand from both consumers and regulatory bodies to include information about the dietary energy content of wines either on wine labels or at an easily accessible location such as a linked website. Provision of this information requires a uniform method of measuring energy content to ensure that the information provided to consumers is useful, consistent and accurate. As is the case for most foods and beverages, it is not practical to measure the energy content of a specific wine product directly. Instead, the usual approach is to calculate the sum of contributions of individual components using published values for energy. In wine, in which water and alcohol typically make up 98% of the product, it is generally accepted that a valid value for energy can be calculated from the alcohol and the sugar content, as these two components contribute the vast majority of the energy.

Recently, questions have been raised about the possible energy contribution of other wine components such as organic acids, glycerol and protein, as well as wine additives, and whether they should be included in any energy calculation. Accurately determining the concentration of these components could require additional expensive analysis that is not typically conducted by production winery laboratories. This raises a secondary question as to whether measured values for these components are necessary, or if the relative variability in their energy content between wines is small enough to allow the use of generic values while still giving an acceptable estimation of energy content. This question must also be taken in the context of the increasing number of reduced and low alcohol products available on the market, where the contribution of the alcohol to the overall energy calculation is much less, leading to a larger relative contribution from other wine components.

To address these questions, data from the AWRI Commercial Services database was used to calculate the impact of different wine components on overall energy calculations. Because the available data on glycerol was relatively limited, an additional survey of 60 commercially available Australian wines (30 red and 30 white) was carried out. Thirty reduced alcohol and low alcohol wines were also sourced from industry partners in Australia to determine if the glycerol values for these wines varied significantly from those in the commercial wine survey.

Typical wine compositional values

The typical wine values listed in Tables 1 and 2 for alcohol, glucose + fructose and titratable acidity are aggregated from around 10,000 wines analysed by AWRI Commercial Services' NATA-accredited laboratory between 2016 and 2020. They have been categorised into red and white wines with rosé wines excluded. Rosé wines, however, can generally be considered to align with white wines for major compositional factors. For simplicity, sugar content has been taken as the sum of the concentrations of glucose and fructose in the wines, as these are the only significant sugars. Other sugars, such as the pentoses and sucrose, are typically only present at levels below 1 g/L.

Results from the glycerol analysis of the additional 30 white and 30 red commercially available wines are shown in Table 3. These values are consistent with results in literature and those in the AWRI Commercial Services database.

Table 1. Typical analytical values for white wines based on aggregated data from AWRI Commercial Services, 2016–2020

	Number of samples (n)	Mean	Standard deviation	1st quartile	Median	3rd quartile
Alcohol (%v/v)	3,343	12.16	1.42	11.7	12.4	13.0
Sugar (glucose + fructose) (g/L)	3,251	9.03	27.23	1.1	2.2	4.4
Titratable acidity (pH 8.2) (g/L)	3,218	6.46	0.92	5.9	6.3	6.9

Table 2. Typical analytical values for red wines based on aggregated data from AWRI Commercial Services, 2016–2020

	Number of samples (n)	Mean	Standard deviation	1st quartile	Median	3rd quartile
Alcohol (%v/v)	6,660	14.16	0.93	13.7	14.2	14.7
Sugar (glucose + fructose) (g/L)	6,511	2.11	6.71	0.7	1.0	1.7
Titratable acidity (pH 8.2) (g/L)	6,470	6.21	0.59	5.8	6.2	6.6

Table 3. Glycerol content (g/L) in commercially available Australian red and white wines surveyed

	Number of samples (n)	Mean	Standard deviation	1st quartile	Median	3rd quartile
White wines	30	5.64	1.06	5.03	5.35	5.88
Red wines	30	9.58	1.16	8.93	9.60	10.08

Of the 30 reduced/low alcohol wines sourced, only three were red wines and the remaining 27 were white wines. The reduced alcohol red wines (all <0.5%v/v alcohol) were found to have a glycerol concentrations of 5.9, 6.2 and 12.8 g/L, similar to the concentrations in equivalent red table wines.

For the reduced/low alcohol white wines the glycerol content ranged from 1.8 to 7.0 g/L with a mean of 4.9 g/L and a median value of 5.0 g/L (Figure 1). Once again, these results are consistent with those seen for equivalent table wines. It should also be noted that reduced and low alcohol white wines tend to have higher sugar concentrations than typical white wines. Reduced alcohol products with alcohol levels above 0.5% were found to have a median sugar (as glucose + fructose) concentration of 11.3 g/L while those below 0.5% alcohol had a median sugar concentration of 49.2 g/L (see Tables 6 and 7). While these results are from a small sample set, they are in line with the general observations for low and reduced alcohol products.

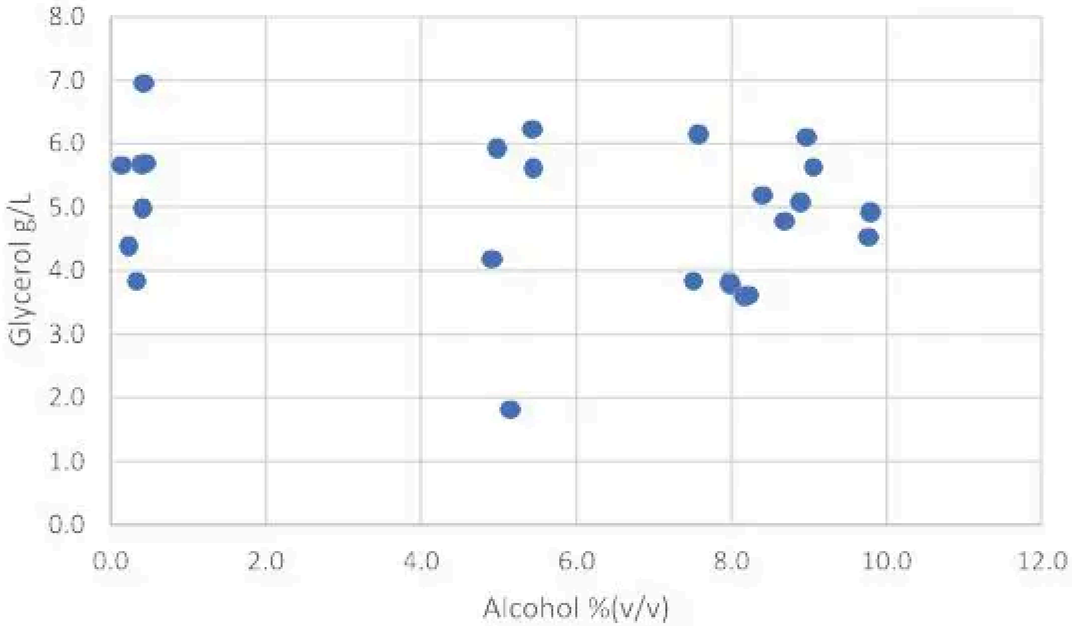

Figure 1. Alcohol and glycerol concentrations for 27 reduced/low alcohol white wines

Impacts on energy content

For a typical white wine with the median alcohol level of 12.4%, the energy contributions of a range of components are given in Table 4. The values in the last two columns show the relative contribution of each component to the final energy value if the concentration levels are at the 1st and 3rd quartile for that component. That is, these values show the impact on overall energy for the typical range of concentrations for that component.

Similarly, for a typical red wine with the median alcohol of 14.2% the energy contributions of the various components are given in Table 5.

In Tables 4 and 5, the values for fats and proteins have been set to zero as these components are rarely present in levels above 0.5 g/L in typical table wines and hence do not make a significant contribution to energy content (usually in the region of 1 kJ/100 mL).

Tables 4 and 5 show that the variation in the energy contribution between the 1st and 3rd quartile values for acids and glycerol is in the order of 0.5%. It is only for sugar in white wine that the typical range of values has an impact greater than 1%.

Table 4. Typical energy contributions of various wine components for a white wine with 12.4% alcohol (284 kJ/100 mL). At this concentration, the alcohol represents 93% of the total energy contribution when all other components are at their median concentrations.

	Median concentration (g/L)	Energy contribution (kJ/100 mL)	% contribution to overall energy at median level	% contribution at 1st to 3rd quartile levels	
Sugar	2.2	4	1.2%	0.6%	2.4%
Titratable acidity (TA)	6.3	8	2.7%	2.5%	2.9%
Fat	0	0	0.0%	0.0%	0.0%
Protein	0	0	0.0%	0.0%	0.0%
Glycerol	5.35	10	3.2%	3.0%	3.5%

Table 5. Typical energy contributions of various wine components for a red wine with 14.2% alcohol (325 kJ/100 mL). At this concentration, the alcohol represents 92% of the total energy contribution when all other components are at their median concentrations.

	Median concentration (g/L)	Energy contribution (kJ/100 mL)	% contribution to overall energy at median level	% contribution at 1st to 3rd quartile levels	
Sugar	1	2	0.5%	0.3%	0.8%
Titratable acidity (TA)	6.2	8	2.3%	2.1%	2.4%
Fat	0	0	0.0%	0.0%	0.0%
Protein	0	0	0.0%	0.0%	0.0%
Glycerol	9.6	17	4.9%	4.6%	5.2%

These calculations suggest that in the case of typical table wines it should be sufficient to use standard values for TA and glycerol in energy calculations, based on the median values for red and white wines. It is important, however, to note that the typical contribution of these components is non-trivial (5.9% for whites and 7.2% for reds) and consideration should therefore be given to their inclusion in the calculation of the overall energy for a wine.

Most wine production facilities would have a reliable knowledge of the sugar content of their wines for labelling and stylistic reasons. Hence it reasonable to assume that this figure would be available without extra cost and could be easily used in any energy calculation. Alternatively, consideration could be given to the approach of using standard figures for sugar based on classes of wine, such as dry, semi-dry, etc. as this would still give values that would have only a marginal effect on the overall accuracy of the final energy declaration.

Impact of components on low alcohol wines

Tables 6 and 7 show the impacts of the different ranges of wine components on the energy content of a 5% and 0.5% v/v alcohol white wine. These alcohol values were arbitrarily chosen as representative of low alcohol and no alcohol products, respectively.

Table 6. Typical energy contributions of various wine components for a 'reduced alcohol' white wine with 5% alcohol (114 kJ/100 mL). At this concentration, the alcohol represents 75% of the total energy contribution when all other components are at their median concentrations.

	Median (g/L)	Energy contribution (kJ/100 mL)	% contribution to overall energy at median level	% contribution at 1st to 3rd quartile levels	
Sugar	11.3	19	12.6%	6.9%	25.7%
Titratable acidity	6.3	8	5.4%	50%	5.9%
Fat	0	0	0.0%	0.0%	0.0%
Protein	0	0	0.0%	0.0%	0.0%
Glycerol	5.35	10	6.3%	5.9%	6.9%

Table 7. Typical energy contributions of various wine components for a 'no alcohol' white wine with 0.5% alcohol (11 kJ/100 mL). At this concentration, the alcohol represents 10% of the total energy contribution when all other components are at their median concentrations.

	Median (g/L)	Energy contribution (kJ/100 mL)	% contribution to overall energy at median level	% contribution at 1st to 3rd quartile levels	
Sugar	49.2	84	73.5%	61.7%	76.2%
Titratable acidity	6.3	8	24.8%	6.7%	7.9%
Fat	0	0	0.0%	0.0%	0.0%
Protein	0	0	0.0%	0.0%	0.0%
Glycerol	5.35	10	29.2%	8.0%	9.3%

The most obvious impact of the lower alcohol concentrations in these products is the significant reduction in overall energy content, even if it is somewhat offset by the higher sugar contents typically seen in these products. This highlights the dominant effect of alcohol on energy content, with the 0.5% alcohol wine having ~10% of the energy content of a typical white table wine if the sugar contents were the same. Also apparent is the increased impact of sugar. Even using the lower sugar values typically found in table wines, moving from the median value of 2.2 g/L to the 3rd quartile value of 4.4 g/L sees a change of 5 kJ/100 mL, an ~11% change. The impacts for sweeter wines are much more significant, and at just 7 g/L the contribution to the energy content of the sugar component would outweigh that of the residual alcohol in the product. For reduced alcohol products with ~5% v/v alcohol, the impact of sugar would not outweigh that of the alcohol until around 70 g/L of sugar.

The impacts of the typical range of values for titratable acidity and glycerol on overall energy content are still relatively minor, even for wines with alcohol levels as low as 0.5% v/v, representing a combined change in energy content of less than 5% across their typical ranges. Given that in a number of markets, including the EU and the US, the proposed allowed variance from the actual value for energy labelling is 20%, it seems that using typical energy contributions for TA and glycerol for a given wine style would still give a satisfactory result without the need for extra analysis. The same is also true of other minor wine components such as protein, which, even at an unlikely value of 0.5 g/L, would contribute less than 1 kJ/100 mL, or less than 1% of the total energy content of a 0.5% v/v alcohol wine.

Conclusions

Based on this analysis, a number of recommendations could be made to ensure the consistency of energy labelling within the wine sector:

- Energy content calculations for wines (both table wines and reduced or low alcohol wines) should be made using measured values for alcohol and sugar and set values for glycerol and titratable acidity (as a proxy for organic acids).
- The set values for glycerol and titratable acidity for red and white wines could be defined by their median values determined from the AWRI wine survey (Table 3).
- Other wine components and additives can be generally ignored as not contributing significantly to the energy content.
- The validity of these assumptions should be reviewed every 10 years by reference to survey data to ensure that the introduction of new technologies or additives has not significantly changed the typical values.
- The energy density figures used for the calculation of energy values for the label wines and wine products in Australia should be those published by FSANZ (see Appendix).

The adoption by Australian regulators of a 20% tolerance for energy values on labels and other communications is worthy of consideration as it would align Australian labelling with other jurisdictions, including major export markets. This would allow the adoption of standard energy content values for classes of product rather than having different values calculated for each individual wine, reducing consumer confusion and increasing efficiencies for producers.

Appendix

For the energy calculations in this article, the following energy density values were used, based on values published by Food Standards Australia New Zealand (FSANZ).

Food component	Energy density kJ/g
Fat	37
Ethanol (drinking alcohol)	29
Proteins	17
Carbohydrates	17
Organic acids	13
Polyols (sugar alcohols, sweeteners)	1–14
Unavailable carbohydrate (including dietary fibre)	8
Glycerol	18

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Technical Note – Typical values for fats, proteins and salt in Australian wine for nutritional labelling

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Introduction

Recent changes to European Union regulations for wine labelling mean that wines produced after 8 December 2023 (i.e. vintage 2024 wines in Australia) will require a value for dietary energy content on the label as well as an online ingredient list and nutritional panel accessed via a unique QR code. The energy value is readily calculated using the procedures outlined in Wilkes (2021a). Many laboratories are also now including it on certificates of analysis for wines destined for Europe. The ingredient listing is also relatively straight forward with a prescribed list of descriptors available in European regulation. More detail on these can be found at the Wine Australia website where there is a webinar on the requirements and other resources. A number of providers both in Australia and Europe are offering services to develop and provide QR codes and linked web sites for use on labels for producers who do not have the capability to do this in-house.

Some of the information required for the nutritional panel includes fats (total and saturated), carbohydrates, sugars, protein and salt. These are not typically measured in the Australian wine industry and the cost for getting a full nutritional panel analysis through a testing laboratory can be approximately $300 per sample. To address this, the AWRI through its commercial arm Affinity Labs has surveyed a range of results from its commercial testing database to determine if a group of typical values might be appropriate for use on European nutritional panels rather than having to test individual wines.

Fats and proteins

Over the last 12 months Affinity Labs has tested 66 wines for nutritional information using an ISO17025 accredited facility and recognised analytical techniques. The samples included:

- Red, white and rosé wines
- 20 wines with less than 11% v/v alcohol
- 9 wines with less than 4.6% v/v alcohol.

Results for fats and proteins are shown in Table 1.

Table 1. Results from analysis of fats and proteins in 66 Australian wines. All results are in g/100 mL

	Average	Standard Deviation	Maximum	Minimum	95th percentile	EU tolerance (European Commission 2012)
Fat	0.0	0.0	0.0	0.0	0.0	1.5
Mono trans fats	0.0	0.0	0.0	0.0	0.0	0.8
Mono-unsaturated fat	0.0	0.0	0.0	0.0	0.0	0.8
Omega 3 fats	0.0	0.0	0.0	0.0	0.0	0.8
Omega 6 fats	0.0	0.0	0.0	0.0	0.0	0.8
Poly trans fats	0.0	0.0	0.0	0.0	0.0	0.8
Poly-unsaturated fat	0.0	0.0	0.0	0.0	0.0	0.8
Protein	0.02	0.01	0.4	0.0	0.4	2.0

None of the wines tested showed any fat content under any of the categories tested. The European guidelines for fats state that levels <0.5 g/100 mL can be declared as 0 g/100 mL. For saturated fat a 0 g/100 mL declaration is allowed for levels < 0.1g/100 mL. This data therefore would support the generic labelling of typical Australian wines with 0 g/100 mL for both fat and saturated fat.

For proteins, as would be expected, small amounts were detected, ranging in concentration from 0 to 0.4 g/100 mL. Similarly to fats, the European guidelines allow amounts of protein below 0.5 g/100 mL to be labelled as 0 g/100 mL. It would therefore seem appropriate that a 0 g/100 mL value would be reasonable for a typical Australian wines.

It is important to note that these results, as stated, can be applied to typical Australian wines, namely unfortified red, white and rosé wines with sugar levels between 0 and 12 g/L of sugar. Based on a previous survey looking at typical energy values in Australian wines (Wilkes 2021) this would represent 99% of Australian red wines and 93% of Australian white wines. The data should not be extrapolated to other wine styles or wine products without careful consideration.

Salt

Salt in the form of sodium chloride is not directly measured in wines. Rather the general approach for regulatory matters in Europe is to measure the concentration of sodium in g/100mL in the wine and then express it as sodium chloride by multiplying it by 2.5. To gain an understanding of the typical levels of salt in Australian wines, the Affinity Labs database was reviewed for wines submitted for metals analysis between 2016 and 2019. This identified 1,851 sodium results for still red, white and rosé wines, which were then converted to salt values, consistent with European regulations, with the results for this data set presented in Table 2 and Figure 1.

Table 2. Calculated salt results for 1,851 Australian still red, white and rosé wines, based on their sodium content. All results are in g/100 mL.

	Average	Standard Deviation	Maximum	Minimum	95th percentile	EU tolerance (European Commission 2012)
Salt	0.013	0.009	0.091	0.000	0.030	0.375

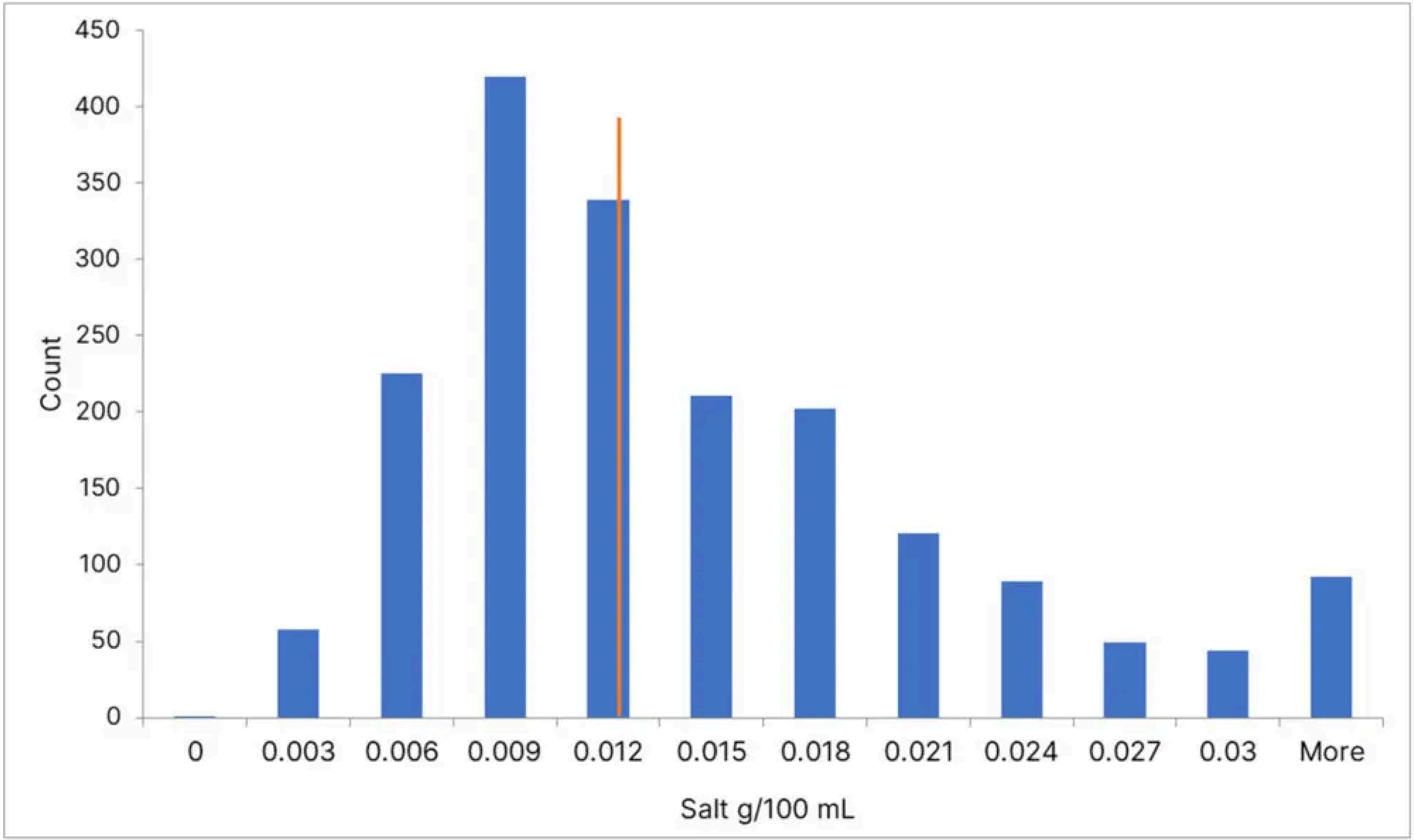

Figure 1. Distribution of calculated salt results for 1,851 Australian red, white and rosé wines still wines based on their sodium content. The orange line represents the median value of 0.011 g/100mL. All results are in g/100 mL. Number on x axis represents upper bound of each range of concentrations.

The European guidelines (European Commission 2012) state that salt concentrations <0.0125 g/100 mL can be declared as 0 g/100 mL. The average value for Australian wines in this dataset, however, falls above this at 0.013 g/100 mL, making it difficult to propose a 0 g/100 mL declaration if almost half the results were falling above the threshold. It could be argued that the tolerance for measurement prescribed in the same reference of 0.375 g/100 mL means that a 0 g/100 mL result could be declared and easily fall within the tolerance. The author contends, however, that this is an interpretation that could be open for debate and would imply some risk of being questioned if the wine was tested in a destination market. Instead, a safer approach would be to declare a result of 0.03 g/100 mL of salt (based on the 95^{th} percentile for the dataset) and given the tolerances allowed this would easily cover all wines in the survey. This would still represent a very low salt content declaration from a consumer intake perspective.

Sugars and carbohydrates

All wine exported to the European Union are required to provide a certificate of analysis which includes a value for sugar content as part of the export licence process. As such this value is readily available to producers when developing their label. Carbohydrates in wine are generally considered for the purpose of nutritional labelling in Europe to include the sugar and glycerol present in the wine. While glycerol content of wine is not regularly measured in Australian wine production, a previous survey (Wilkes 2021b) showed typical values of 0.5 g/100 mL for white wines and 1.0 g/100 mL for reds. It is reasonable to add the appropriate typical glycerol figure to the measured sugar value to produce a value for carbohydrate that will fall within the tolerance (2.0 g/100 mL) as prescribed in the guidance document (European Commission 2012).

Conclusion

Based on the survey data presented above and the published tolerances and rounding guidelines for data in European nutritional panels, it is easily defensible to label typical Australian still wines with 0 g/100mL for fat, saturated fat and protein. Furthermore, using a value of 0.03 g/100 mL for salt would present little risk of dispute and easily fall within the published tolerances. It is arguable that a 0 g/100 mL claim for salt would also fall within the prescribed tolerances, but this may be open for dispute given the published threshold for a 0 g/100 mL claim. All exported wine has a known concentration for sugar and this can be used for sugar value in the nutritional panel, with the carbohydrate value calculated by simply adding the typical value for glycerol (0.5 and 1.0 g/100 mL for white and red wines, respectively) to the sugar value.

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Nutritional panel testing and labelling for the export of wine

Introduction

Recent changes to European Union regulations for wine labelling mean that wines produced after 8 December 2023 (i.e. vintage 2024 wines in Australia) will require a value for dietary energy content on the label as well as an online ingredient list and nutritional panel accessed via a unique QR code. While the EU is the first market to introduce nutritional labelling on wine, other markets are likely to follow with variations on the same theme.

Nutritional testing and EU labelling compliance

Comprehensive testing for nutritional information costs in the region of $300 per wine. However, Australian producers can comply with the new EU regulations by using average or indicative values.

Affinity Labs has surveyed a range of results from its commercial testing database to determine these average values. More information on this research can be found on the AWRI website.

In circumstances where a producer would like a documented set of values for a particular wine, Affinity Labs offers *Nutritional information for EU wine labels* for dry wine, using a combination of average values and wine analysis, for a fraction of the cost of comprehensive testing.

For more information on nutritional panel testing, search ‘nutritional panel’ on our wine webpage.