



New Zealand Wine
the riches of a clean green land

New Zealand Winegrowers
GUIDE TO NZ WINEMAKING PRACTICES

April 2007

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TABLE OF CONTENTS

| | |
|---|----|
| 1. WINEMAKING REGULATIONS..... | 4 |
| 2. DEFINITION OF WINE | 5 |
| 3. FOOD ADDITIVES..... | 6 |
| 4. PROCESSING AIDS..... | 8 |
| 5. CONTAMINANTS AND NATURAL TOXICANTS..... | 9 |
| 6. AGRICULTURAL CHEMICAL RESIDUES | 10 |
| 7. FOOD SAFETY AND WINERY HYGIENE | 11 |
| 8. STANDARDS OF FILL..... | 12 |
| 9. EXPORTS | 13 |
| APPENDIX - ALPHABETICAL TABLE OF NZ WINEMAKING PRACTICES..... | 14 |

1. WINEMAKING REGULATIONS

The following laws and regulations govern winemaking practices in New Zealand:

- Food Act 1981
- Australia New Zealand Food Standards Code (the “Food Standards Code”)
- New Zealand (Maximum Residue Limits of Agricultural Chemicals) Food Standards 2002 & 2007
- Wine Act 2003
- Wine Regulations 2006
- Wine (Specifications) Notice 2006
- Food Hygiene Regulations 1974
- Weights and Measures Regulations 1999

The New Zealand Food Safety Authority (NZFSA) is the government agency responsible for regulating all winemaking practices – with the exception of standards of fill which are governed by the Ministry of Consumer Affairs.

2. DEFINITION OF WINE

Standard 2.7.4 of the Food Standards Code sets general definitions for wine and wine product and provides permissions for the addition of certain foods during the production of wine.

Definition of wine

Wine is defined as “the product of the complete or partial fermentation of fresh grapes, or a mixture of that product and products derived solely from grapes.” This definition includes sparkling and fortified wine. There are no separate definitions for these products.

The following may be added to wine during production –

- grape juice and grape juice products; and
- sugars (the list of permitted sugars is in Standard 2.8.1); and
- brandy or other spirit; and
- added water, where the water is necessary to incorporate any permitted food additive or processing aid.

Definition of wine product

Wine product is defined as “a food containing no less than 700 mL/L of wine as defined in this Standard, which has been formulated, processed, modified or mixed with other foods such that is not wine.”

3. FOOD ADDITIVES

What is a food additive?

Standard 1.3.1 of the Food Standards Code controls the additives that may be used in winemaking. A food additive can only be added to wine where expressly permitted in this standard.

A food additive is any substance not normally consumed as a food in itself and not normally used as an ingredient of food, but which is intentionally added to a food to achieve one or more specified technological functions. It or its by-products may remain in the food. Food additives must meet the identity and purity standards set out in Standard 1.3.4.

How can food additives be used?

Food additives can only be used:

- to perform one or more technological functions;
- at a level that does not exceed the maximum level necessary to achieve one or more technological functions under conditions of Good Manufacturing Practice (GMP);
- in compliance with any conditions, restrictions or maximum permitted levels specified in the standard.

The following extract from Schedule 5 to Standard 1.3.1 Food Additives outlines the key technological functions that may be performed by food additives used in wine production.

| Functional class sub-classes | Definition |
|---|---|
| Acidity regulator acid, alkali, base, buffer, buffering agent, pH adjusting agent | alters or controls the acidity or alkalinity of a food |
| Antioxidant antioxidant, antioxidant synergist | retards or prevents the oxidative deterioration of a food |
| Colour fixative colour fixative, colour stabiliser | stabilises, retains or intensifies an existing colour of a food |
| Colouring | adds or restores colour to foods |
| Preservative anti-microbial preservative, anti-mycotic agent, bacteriophage control agent, chemosterilant, disinfection agent | retards or prevents the deterioration of a food by micro organisms |
| Sequestrant | forms chemical complexes with metallic ions |
| Stabiliser binder, firming agent, water binding agent, foam stabiliser | maintains the homogeneous dispersion of two or more immiscible substances in a food |

Additives may be carried over from other ingredients used in the production of a wine, as well as being added directly. In any case, the level of additive must not exceed the level permitted for the final product.

Two or more additives may be used in combination to achieve the same technological function. In this case, the sum of the quantities obtained by dividing the amount of each food additive used by the maximum permitted level for that food additive must not exceed 1.

Permitted additives

The Appendix to this document sets out the food additives permitted for use in wine production, and the conditions, restriction and maximum levels for their use. Where a maximum level is specified, the level refers to the maximum amount which may be present in the wine as sold.

The maximum level for many food additives is specified as “good manufacturing practice” (GMP). GMP is a limit and it does not permit excessive usage or poor winemaking practices. The Codex Alimentarius Commission Procedural Manual sets out the following relevant criteria for use in assessing compliance with Good Manufacturing Practice:

- the quantity of additive added to food shall be limited to the lowest possible level necessary to accomplish its desired effect;
- the quantity of the additive that becomes a component of food as a result of its use in the manufacture, processing or packaging of a food and which is not intended to accomplish any physical, or other technical effect in the finished food itself, is reduced to the extent reasonably possible; and
- the additive is prepared and handled in the same way as a food ingredient.

The manner in which a food is intended to be presented (e.g. by the use of such quality descriptors as natural, pure, traditional etc) may affect the type and level of food additives that could be used in accordance with GMP. Similarly, the type and level of food additives used may affect the way in which a food may be presented.

4. PROCESSING AIDS

What is a processing aid?

Standard 1.3.3 of the Food Standards Code regulates the use of processing aids in food manufacture. A processing aid can only be used for wine production where expressly permitted in this Standard.

Processing aids are substances that are used in the processing of raw materials, foods or ingredients to fulfil a technological purpose relating to treatment or processing, but do not perform a technological function (i.e. as set out under “Food Additives” above) in the final food.

Processing aids must meet the identity and purity standards set out in Standard 1.3.4.

How can processing aids be used?

Processing aids can only be used:

- to fulfil a technical purpose related to treatment or processing of wine;
- in compliance with any conditions, restrictions or maximum permitted levels specified in the standard; and
- at the lowest level necessary to achieve the relevant technical function, irrespective of any maximum permitted level specified.

Permitted processing aids

A wide range of processing aids is permitted for winemaking. Appendix 1 summarises the main processing aids used in wine production. For a complete list, consult Standard 1.3.3.

The maximum level for many food additives is specified as “good manufacturing practice” (GMP). GMP is a limit and it does not permit excessive usage or poor winemaking practices. For guidance on GMP, see the section on “Food Additives”.

5. CONTAMINANTS AND NATURAL TOXICANTS

Standard 1.4.1 establishes the general principle that levels of contaminants and natural toxicants in all foods should be kept As Low As Reasonably Achievable (the ALARA principle) and sets out the maximum levels of specified metal and non-metal contaminants and natural toxicants that may be present in certain foods.

Maximum levels for wine

There is only one maximum level that applies to wine. Red, white and fortified wines must not exceed 3 g of methanol per litre of ethanol.

Other contaminants

Other contaminants, including metals such as arsenic, cadmium, copper, lead, mercury and tin, do not have maximum levels set in respect of wine. However, levels of these contaminants in wine must be as low as reasonably achievable.

6. AGRICULTURAL CHEMICAL RESIDUES

Who is responsible for residues?

Maximum residue levels (MRLs) for agricultural chemicals applying to wine sold in New Zealand are governed by the New Zealand (Maximum Residue Limits of Agricultural Chemicals) Standard.

Growers must:

- ensure that agricultural chemicals are applied in accordance with label requirements, including withholding periods (pre-harvest intervals);
- maintain a record of applications of agricultural chemicals (spray diary).

Winemakers must:

- ensure that wine released for sale in New Zealand complies with the maximum residue limits specified in the Standard (NB: MRLs in New Zealand are established for grapes rather than wine. However, the MRLs for grapes are in practice applied to finished wine as well. With a few exceptions, this is the case in most parts of the world);
- ensure that export wine complies with the maximum residue limits applying in the export market.

We strongly recommend that winemakers monitor the timing and levels of agricultural chemical applications through spray diaries to ensure that wines released for sale comply with MRLs. (NB: levels of many agricultural chemicals will reduce through the winemaking process, and it is permissible to blend wines to achieve residue levels in finished wine that are within MRLs.)

We also strongly recommend that winemakers work with growers to ensure that the levels of residue in their wines are kept to the lowest level possible.

Where do I find information on MRLs?

New Zealand Winegrowers publishes an annual Export Wine Grape Spray Schedule and an Agrichemical Spray Diary to assist growers and wineries to comply with MRLs in all markets. This is available free of charge to all members.

7. FOOD SAFETY AND WINERY HYGIENE

Food safety and winery hygiene are currently principally regulated under the Food Act 1981. Wineries have the option of complying with the Food Hygiene Regulations 1974 or putting into place an audited Food Safety Programme.

Most wineries are operating under the Food Hygiene Regulations, which are administered by the local District Health Boards on behalf of the NZFSA. This may involve an inspection at the winery's cost. A copy of the Food Hygiene Regulations can be made available on request.

A Food Safety Programme is an independently audited programme based on HACCP principles. This is similar to the proposed Wine Standards Management Plan under the Wine Act, only on a more generic basis.

The new regime under the Wine Act overlaps the Food Act regime at present. The Wine Regulations 2006 and the Wine (Specifications) Notice 2006 also regulate food safety and winery hygiene, although they will not become fully operational until wineries register their Wine Standards Management Plans. The Food Act system will be superseded by the implementation of Wine Standards Management Plans under the Wine Act in 2008. New Zealand Winegrowers is working with NZFSA to develop a template Wine Standards Management Plan for use by all members together with a supporting Code of Practice.

8. STANDARDS OF FILL

Standards of fill are regulated by the Ministry of Consumer Affairs under the Weights and Measures Regulations 1999.

The adequacy of fill levels for wine are measured on the basis of the average volume of bottles in a particular lot. There are three basic rules:

- First, the actual contents of the packages in a lot must not be less, on average, than the stated quantity. They can, however, be more on average than the stated quantity.
- Second, no more than 2.5% of the packages in a lot may be non-standard. A package is non-standard if the quantity is less than the stated quantity on the package by more than a tolerable deficiency. For a 750ml bottle, the tolerable deficiency is 15ml.
- Third, there must be no inadequate packages. A package is inadequate if the quantity of goods is less than the stated quantity on the package by more than twice the tolerable deficiency. For a 750ml bottle, a deficiency of 30ml will make it an inadequate package.

These averages can be determined on the basis of samples. Sample ranges are specified in the legislation depending on the size of the lot. For further information, see the Ministry of Consumer Affairs Fact Sheet on

<http://www.consumeraffairs.govt.nz/measurement/businessinfo/avquantsystem.html>.

9. EXPORTS

Australia

Wine that is made in accordance with New Zealand winemaking practices may legally be sold in Australia. This principle is enshrined in the Food Standards Code, the Trans-Tasman Mutual Recognition Agreement and the Mutual Acceptance Agreement on Oenological Practices.

Argentina, Canada, Chile, USA

Along with Australia, the above countries are signatories to the World Wine Trade Group Mutual Acceptance Agreement on Oenological Practices. This means that wines made in accordance with New Zealand winemaking practices may legally be sold in all of these countries.

European Union

Wine that is exported to European Union Member States must be made in accordance with the European Union rules applying to winemaking practices. Details are available on the NZFSA website: <http://www.nzfsa.govt.nz/wine/omar/index.htm>

Other markets

Many other markets have their own winemaking regulations, with which exporters are supposed to comply. In practice, it can be extremely difficult to find useful information about these regulations. New Zealand Winegrowers holds limited information about some markets, which can be provided upon request.

Exporters should note that a number of commonly used additives and processing aids are not permitted for use in Japan, namely:

- copper sulphate
- potassium ferrocyanide
- calcium alginate
- potassium alginate
- potassium caseinate
- potassium bicarbonate
- dimethyl dicarbonate
- metatartaric acid.

ALPHABETICAL TABLE OF NEW ZEALAND WINEMAKING PRACTICES

| MATERIAL | FOOD ADDITIVE | PROCESSING AID | USE OR PRESENCE IN WINE | PERMITTED LEVEL |
|--|---------------|----------------|--|--|
| Activated carbon | | ✓ | Generally permitted for technical purposes | GMP |
| Agar | | ✓ | Generally permitted for technical purposes | GMP |
| Alginates (alginic acid, sodium & calcium alginates) | | ✓ | Generally permitted for technical purposes | GMP |
| Ammonium phosphates | ✓ | | To perform a specified technical function | GMP |
| Argon | | ✓ | Generally permitted for technical purposes | GMP |
| Arsenic | | | Naturally occurring or present as a result of winemaking practices | As low as reasonably achievable |
| Ascorbic acid | ✓ | | To perform a specified technical function | GMP |
| Bentonite | | ✓ | Generally permitted for technical purposes | GMP |
| Brandy | | | Under the definition of wine. | In accordance with definition of wine. |
| Cadmium | | | Naturally occurring or present as a result of winemaking practices | As low as reasonably achievable |
| Calcium alginate | | ✓ | Generally permitted for technical purposes | GMP |
| Calcium ascorbate | ✓ | | To perform a specified technical function | GMP |
| Calcium carbonates | ✓ | | To perform a specified technical function | GMP |
| Calcium phosphates | ✓ | | To perform a specified technical function | GMP |
| Calcium sulphate (gypsum) | | ✓ | Generally permitted for technical purposes | GMP |
| Caramel I – plain | ✓ | | To perform a specified technical function | GMP |
| Caramel II – caustic sulphite process | ✓ | | To perform a specified technical function | GMP |
| Caramel III – ammonia process | ✓ | | To perform a specified technical function | GMP |
| Caramel IV – ammonia sulphite process | ✓ | | To perform a specified technical function | GMP |
| Carbon dioxide | ✓ | | To perform a specified technical function | GMP |
| Casein | | ✓ | Generally permitted for technical purposes | GMP |
| Cellulose (microcrystalline and powdered) | | ✓ | Generally permitted for technical purposes | GMP |

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| MATERIAL | FOOD ADDITIVE | PROCESSING AID | USE OR PRESENCE IN WINE | PERMITTED LEVEL |
|--|---------------|----------------|---|--|
| Citric acid | ✓ | | To perform a specified technical function | GMP |
| Copper | | | Naturally occurring or present as a result of winemaking practices | As low as reasonably achievable |
| Copper sulphate | | ✓ | Generally permitted for technical purposes | GMP |
| Cupric citrate on a bentonite base | | ✓ | Removal of sulphide compounds from wine | GMP |
| Diatomaceous earth | | ✓ | Generally permitted for technical purposes | GMP |
| Dimethyl dicarbonate | ✓ | | To perform a specified technical function | 200 |
| Dimethyl polysiloxane (polydimethylsiloxane) | | ✓ | Generally permitted for technical purposes | GMP |
| Egg whites | | ✓ | Generally permitted for technical purposes | GMP |
| Enzymes | | ✓ | As per Std 1.3.3 Clauses 15-17, including protease (papain), betaglucanase, pectolytics, urease | |
| Erythorbic acid | ✓ | | To perform a specified technical function | GMP |
| Ethyl alcohol | | ✓ | Generally permitted for technical purposes | GMP |
| Ethyl maltol | ✓ | | To perform a specified technical function | 100 mg/kg Wine made with other than <i>Vitis vinifera</i> grapes only |
| Fumaric acid | ✓ | | To perform a specified technical function | GMP |
| Grape juice and grape juice products | | | Under the definition of wine. | In accordance with the definition of wine. |
| Grape skin extract | ✓ | | To perform a specified technical function | GMP |
| Gum Arabic (acacia) | ✓ | | To perform a specified technical function | GMP |
| Hydrogen Peroxide | | ✓ | Bleaching agent Removal of sulphur dioxide | 5 mg/kg |
| Ion exchange resins | | ✓ | As per Std 1.3.3 Clause 8 | |
| Isinglass (and other fish collagens) | | ✓ | Decolourant, clarifying, filtration and adsorbent agent | GMP |
| Kaolin (aluminium silicate) | | ✓ | Generally permitted for technical purposes | GMP |
| Lactic acid | ✓ | | To perform a specified technical function | GMP |

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| MATERIAL | FOOD ADDITIVE | PROCESSING AID | USE OR PRESENCE IN WINE | PERMITTED LEVEL |
|--|---------------|----------------|---|--|
| Lead | | | Naturally occurring or present as a result of winemaking practices | As low as reasonably achievable |
| Lysozyme | | ✓ | Generally permitted for technical purposes | GMP |
| Malic acid | ✓ | | To perform a specified technical function | GMP |
| Malolactic bacteria | | ✓ | Generally permitted for technical purposes | GMP |
| Maltol | ✓ | | To perform a specified technical function | 250 mg/kg Wine made with other than <i>Vitis vinifera</i> grapes only |
| Mercury | | | Naturally occurring or present as a result of winemaking practices | As low as reasonably achievable |
| Metatartaric acid | ✓ | | To perform a specified technical function | GMP |
| Methanol | | | Naturally occurring or present as a result of winemaking practices | 3g of methanol per litre of ethanol |
| Milk and milk solids | | ✓ | Generally permitted for technical purposes | GMP |
| Nitrogen | | ✓ | Generally permitted for technical purposes | GMP |
| Oak | | ✓ | Use in manufacture of wine | |
| Oxygen | | ✓ | Generally permitted for technical purposes | GMP |
| Phytates | | ✓ | Decolourant, clarifying, filtration and adsorbent agent Microbial nutrient or microbial nutrient adjunct | GMP |
| Polyoxyethylene (40) stearate | ✓ | | To perform a specified technical function | GMP |
| Polyvinyl poly pyrolidone | | ✓ | Decolourant, clarifying, filtration and adsorbent agent | 100 mg/kg |
| Potassium alginate | | ✓ | Generally permitted for technical purposes | GMP |
| Potassium carbonates | ✓ | | To perform a specified technical function | GMP |
| Potassium ferrocyanide | | ✓ | Decolourant, clarifying, filtration and adsorbent agent | 0.1 mg/kg |
| Potassium hydrogen tartrate (potassium bitartrate) | | ✓ | Generally permitted for technical purposes | GMP |
| Potassium sodium tartrate | ✓ | | To perform a specified technical function | GMP |

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| MATERIAL | FOOD ADDITIVE | PROCESSING AID | USE OR PRESENCE IN WINE | PERMITTED LEVEL |
|--|---------------|----------------|--|---|
| Potassium tartrate | ✓ | | To perform a specified technical function | GMP |
| Silicates | | ✓ | Generally permitted for technical purposes | GMP |
| Sodium alginate | | ✓ | Generally permitted for technical purposes | GMP |
| Sodium ascorbate | ✓ | | To perform a specified technical function | GMP |
| Sodium carbonates | ✓ | | To perform a specified technical function | GMP |
| Sodium erythorbate | ✓ | | To perform a specified technical function | GMP |
| Sorbic acid and sodium, potassium and calcium sorbates | ✓ | | To perform a specified technical function | 200 mg/kg |
| Sorbitan monostearate | ✓ | | To perform a specified technical function | GMP |
| Spirits | | | Under the definition of wine. | In accordance with the definition of wine |
| Sugars | | | Under the definition of wine. | In accordance with the definition of wine |
| Sulphur dioxide and sodium and potassium sulphites | ✓ | | To perform a specified technical function | 250 mg/kg for wines with less than 35g/L residual sugar 400 mg/kg for wines with more than 35 g/L residual sugar |
| Tannic acid | | ✓ | Generally permitted for technical purposes | GMP |
| Tannins | ✓ | | To perform a specified technical function | GMP |
| Tartaric acid | ✓ | | To perform a specified technical function | GMP |
| Tin | | | Naturally occurring or present as a result of winemaking practices | As low as reasonably achievable |
| Water | | | Under the definition of wine. | Must be "clean" Only permitted to the necessary to incorporate any permitted food additive or processing aid. |
| Yeast nutrients | | ✓ | As per Std 1.3.3 Clause 18 | GMP |
| Yeasts | | ✓ | Under the definition of wine | In accordance with the definition of wine |