RESOLUTION ECO 5/2004

BASIC LEVEL REQUIRED FOR PROFESSIONALS INVOLVED IN THE INTERPRETATION OF THE RESULTS OF ANALYSIS

THE GENERAL ASSEMBLY,

UPON THE PROPOSAL by Commission III "Economy" based on the works of the experts group "Training",

CONSIDERING the resolution ECO 1/2004 taking into account OENO 2/91 relating to the training of oenologists, upper training level and Resolution OENO 1/99 which defines the field of activity for wine professionals and which implies an explanation of each sector activity,

CONSIDERING that these competencies can only be acquired by guaranteeing basic training,

CONSIDERING that it is desirable to establish a general framework which each country can adapt to its particular situation,

RECOMMENDS TO MEMBER STATES that they take into consideration the following elements for developing training programmes for professionals involved in the interpretation of the results of analysis.

Theory

A. Oenology

I. Composition and development of wine. Microbiology and biochemistry of wine.

II. Work and treatment of wine.

III. Analysis and control of must and wine.

IV. Products and co-products derived from vines and wine.

B. Vitivinicultural law and legislation

C. Food safety

D. Wine and vine products in the human environment

Seminars and tutorials

Sensory analysis

Chemical and microbiological controls and analyses

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Analysis and interpretation of results

Detailed programme

The detailed programme given below represents the minimum programme.

A. Oenology

I. Composition and development of wine.

1.1. Composition of wine.

Alcohols. Sugars. Organic acids. Mineral constituents. Phenolic compounds. Nitrogen compounds. Neutral polysaccharides. Volatile compounds.

Aromatic compounds, other compounds, etc.

Comparison between the composition of must and wine.

Relation between the composition and sensory characteristics.

1.2. Acidity and pH.

State of the acids in the wine, acidimetric balances.

1.3. Oxidation-reduction phenomena.

Oxidation-reducing systems for wine.

Dissolution of oxygen in wines. Oxidisable substances in wine – mechanism of oxidation of wine constituents.

Application to oenology of the concept of oxidation-reduction potential. Determination of this potential.

1.4. Macromolecules and colloidal phenomena in wines.

Real solutions and colloidal state.

Stability factors of macromolecules and colloidal suspensions.

Flocculation. Sedimentation. Adsorption.

Concept of protective colloids. Natural wine macromolecules. Colloids of accidental formation in wines.

1.5. Precipitations of physico-chemical origins in wines.

Tartaric precipitations.

Ferric precipitations. Chemical and physico-chemical phenomena of “ferric casse”. Influence of pH and organic acids.

Formation of ferric complexes.

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Cupric precipitations or “cuprous casse”.
Coagulation of proteins or “protein casse”.
Precipitation of colouring matter.
Precipitation of oxidasic origin.
Characteristics and predicting cloudiness and deposits.

1.6. Microbial alterations.

1.6.1. Microbial alterations.
1.6.2. Alterations of yeast origin, fleur.
1.6.3. Alterations of bacterial origin

1.6.3.1. Lactic bacteria.

Degradation of pentoses.
Degradation of citric acid.
Degradation of tartaric acid: tourne.
Degradation of glycerol: bitterness, “graisse disease”.

1.6.3.2. Acetic bacteria.

Formation of acetic acid and ethyl acetate.

II. Working and treatment of wine

2.1. Knowledge and quality of products used in oenology.

O.I.V. International Oenological Codex
International Code of Oenological Practices.

2.2. Hygiene.

Hygiene of premises, materiel and facilities.
Hygiene of wine. Prevention of microbial and physico-chemical accidents.

2.3. Fining of wines.

Fining theory. Coagulation of proteins in wine. Physico-chemical phenomena in play. Over-fining.
Fining practices and main fining agents used. Lees from fining.

2.4. Filtration of wines.

Filtration theory. The mechanisms of filtration: straining and adsorption.
Frontal and tangential flow. Rate and clogging of filtering surfaces. Filtrating material: cellulose, diatomaceous earth, perlite, membranes, etc.
Filtration techniques. Choice of a filtration process. Filterability tests.

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Comparison of fining and filtration effects.

2.5. Centrifugation of wines.

Centrifugation theory. Material principle.

2.6. Physical treatments.

Biological stabilisation of wines by heat: pasteurisation.

Stabilisation and concentration by cold.

Various processes.

2.7. Physico-chemical and chemical treatments.

Theory and practice of treatments.

Use of mentioned products according to the O.I.V. International Code of Oenological Practices and products authorised for experimentation.

Sulphurous acid in wines: role, state and techniques for use.

Inert gases in oenology.

2.8. Storing wine.

Manipulation. Blending. Topping. Racking.

Storing with inert gases.

2.9. Winemaking.

In wood. In vats. In bottles and other techniques.

2.10. Packaging.

Blending. Technical control of wine (stability and filterability).

Material, packaging processes and sealing methods.

III. Analysis and control of must and wine.

3.1. Sensory analysis.

General presentation on the wine tasting.

Sensory organs. Physiology of taste.

Relation between the composition of wines and their sensory characteristics.

Vocabulary for wine tasting.

Knowledge and recognition of primary tastes.

Concept of balance and harmony.

Initiation to wine tasting, spirit beverages of vitivinicultural origin and other products.

Determination of sensibility thresholds and differentiation of odours.

Search for defects and alterations.

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Tasting wines from various vine varieties, various technologies and various vineyards.
Tasting panel.

3.2. Analysis and chemical control.

3.2.1. Methods of analytical chemistry.

3.2.1.1. Treatments prior to analysis.

Evaporation. Mineralisation by dry process, by wet process.
Liquid-liquid, liquid-solid, gas-solid extractions.
Distillation, entrainment by vapour and rectification.
Ion exchangers.
Clarification. Filtration. Centrifugation. Lyophilisation, dialysis, etc.

3.2.1.2. Separation and determination methods.

Precipitation and gravimetric methods.
Chromatographies (paper, thin-layer, low pressure, vapour, high performance liquid, etc.).

3.2.1.3. Analysis by chemical processes.

Volumetric methods (acids, bases, oxydation-reduction).

3.2.1.4. Analysis by physical processes.

Potentiometry (pH-metry, potentiometric determination, specific potentiometry).
Polarimetry. Refractometry.
Colourimetry, turbidity, nephelometry.
Spectrophotometry (visible, UV, IR*, NMR*, MS*).
Spectrofluorimetry.*
Emission spectrophotometry (Flame photometry, Plasma torch*, etc.).
Atomic absorption (with flame and without flame).
Electrophoresis*, Isotachophoresis*.
* The techniques with an asterisk are treated at a minimum on a principle level.

3.2.1.5. Enzymatic analyses.

3.2.1.6. Automated analyses.

3.2.2. Principles of methods of analysis of musts and wines.

3.2.2.1. Basic analyses and examinations.

Mass density and relative density. Dry total extract.
pH, total acidity, volatile acidity.
Alcoholic strength.

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Reducing sugars.
Total and free sulphur dioxide.
Malic acid (Qualitative search).
Colour and limpidity.
Characterisation of cloudiness, deposits and alterations of wines.
Tartaric deposits. Various casses.
Nitrogen precipitations. Microbial alterations.
Abnormal taste brought by the raw matter, by materials or during storage.
3.2.2.2 Complementary analyses and examinations.
Main acids: tartaric, malic, citric, lactic, succinic*.
Mineral anions and cations: potassium, sodium, calcium, magnesium, iron, copper, chloride, sulphates, etc.
Cinders and alkalinity of cinders.
Phenolic compounds and chromatic characteristics* of wines.
Carbon dioxide, glycerol, butane-2-3-diol, ethanol, ethyl acetate.
Determination of the oxydasic activity (must).
Authorised additives (sorbic acid, ascorbic acid, etc.).
Biological search for antiseptics.
Search for wetting, fortification, glycerinating, enrichment.
Stability tests.

3.3. Analyses and microbiological control.

- of raw material.
- of fermentations.
- of storage, making, packaging.

Control of hygiene of the winery.

3.4. Interpretation of results.

I. Products and co-products derived from vine and wine.

Analysis, control of products of vine and wine and other derived products.
Interpretation of results.

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B. Vitivinicultural law and legislation

I. General regional, national and international aspects.

II. Legislation concerning foodstuffs. Applications for products of viticultural origin.

III. Labour law. Economic law. Commercial law. Tax law. Expertise, etc.

IV. Rights and responsibilities of the oenologist.

C. Food safety

D. Wine and vine products in the human environment

I. Impact of the consumption of wine and other vine products on human health.

Seminars

Chemical and microbiological control and analysis.

Sensory analysis.

Analysis and interpretation of results

Tutorials on the field and in the laboratory

Sensory analysis.

Chemical and microbiological control and analysis.

Analysis and interpretation of results.

Internship

A field work internship is highly recommended.

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