RESOLUTION OIV-OENO 630-2020

OIV GUIDE TO IDENTIFY HAZARDS, CRITICAL CONTROL POINTS AND THEIR MANAGEMENT IN THE WINE INDUSTRY

THE GENERAL ASSEMBLY,

CONSIDERING that food safety is one of the fundamental requirements in all societies,

CONSIDERING that in the last decades several local actions have been carried out that try to give a normative framework for food safety in wine production,

CONSIDERING the need to harmonize actions of wine safety practices in wine production processes,

CONSIDERING the need to have agreed criteria on potential hazards that might affect wine safety during processing and transformation of wine products,

CONSIDERING the need to identify the risks and the critical points on which the Operators, the Sector Organizations and the National or Regional Administrations must pay attention and review,

CONSIDERING the previous works carried out jointly by representatives of various Groups of Experts,

CONSIDERING that there are actions taken by the OIV on certain aspects related to the food safety of wine products and in particular the resolutions: CST 1/2007, relating to Traceability guidelines in the vitivinicultural sector; VITI/OENO 1/2005, related to the Code of sound vitivinicultural practices in order to minimise levels of Ochratoxin A in vine-based products; OIV-CST 369-2011 regarding the OIV Code of good vitivinicultural practices in order to minimize the presence of biogenic amines in vine-based products; OIV-COMEX 502-2012 relating to the Revision of the limit of detection and limit of quantification related to potentially allergenic residues of finning agent proteins in wine,

DECIDES to adopt the following OIV GUIDE TO IDENTIFY HAZARDS AND CRITICAL CONTROL POINTS IN THE WINE INDUSTRY, and

REQUEST that this guide shall be periodically reviewed and complemented by applying it to the scope of other vine-based products, when deemed necessary.

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OIV Guide to identify hazards and critical control points in the wine industry

1. Introduction

Companies of the Wine Sector must plan, implement, operate, maintain and update a Wine Safety Management System (WSMS), in accordance with the principles of the Hazard Analysis and Critical Control Points (HACCP) of the Codex Alimentarius. Said WSMS consist of effective management procedures that vitivinicultural products are safe for consumers.

The implementation of a HACCP system in a winery must always be accompanied by compliance with:

a prerequisites program (PRP) containing all the elements that can ensure wine safety or make up the hygiene system in a winery (see Annex 1)

processes of grape production according to Good Agricultural and Viticultural Practices (GAVP) and the OIV criteria

the standards of the International Code of Oenological Practices of the OIV and of Codex Alimentarius.

The analysis of the hazards, based in the HACCP system, can allow the risk assessment and if they exist the determination of the Critical Control Points as well as the resulting actions. This enables the development of a Self-Control Plan that makes wine production safe for human consumption.

The WSMS has to be compatible and referable to the OIV rules, particularly the International Code of Oenological Practices. It has also to comply with the national legislation and the specific winemaking orientations and other standards of quality voluntarily agreed by cellar of the country of origin.

The implementation process of the WSMS will be adjusted to the reality and uniqueness of each winery. The WSMS must be implemented both for the wine-producing and wine trading companies.

Since implementation of HACCP-based procedures in primary production enterprises is quite problematic, the availability of a Guide to Good Agricultural and Viticulture Practices (GAVP) for vineyards can become the best tool for an adequate program of vine protection and the harvests' sanitary specifications as well as for the whole wine production process.

Normative references:

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- HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEM AND GUIDELINES FOR ITS APPLICATION Annex to CAC/RCP 1-1969. Amendment 1999 and Revisions 1997 and 2003. Codex Alimentarius
- UE COMMISSION NOTICE on the implementation of food safety management systems covering prerequisite programs (PRPs) and procedures based on the HACCP principles, including the facilitation/flexibility of the implementation in certain food businesses; Official Journal EU-2016/C, 278/01
- ISO 22000:2018(E): Food safety management systems — Requirements for any organization in the food chain

2. Definitions

For the purposes of this document, the following terms and definitions apply.

Control point: any step at which biological, chemical or physical hazards can be controlled.

Corrective action: action to take when the results of the monitoring of the CCPs (Critical Control Points) or oPRP (Operational Prerequisite Program) indicate loss in the control of the process or that a monitored parameter exceeds the pre-fixed critical limit.

Critical Control Point (CCP): step in the process at which control measurements are applied to prevent or reduce a significant wine safety hazard not to exceed a critical limit, and measures enable the application of corrections.

Critical limit: value that separates the acceptability from the unacceptability in a certain phase of a process. Critical limits are established to determine whether a CCP remains in control. If a critical limit is exceeded or not met, the products affected are to be handled as potentially unsafe products.

Decision tree: logical sequence of questions and answers that allow to make an objective decision on a specific question.

Flow diagram: schematic and systematic representation of the sequence and interactions of steps in the production and commercialization process.

Good manufacturing practices (GMP): work practices in the wine industry, including the design of a product, the use of ingredients that meet the established standards, the observation of codes of hygiene practices in the transformation of the product and the adequate distribution systems that ensure that the product reaches the consumer in satisfactory conditions.

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Gravity/Severity/Adverse effect: impact of the potential outcome of the hazard on a consumer's health.

Hazard analysis: The process of collecting and evaluating information on hazards and conditions leading to their presence to decide which are significant for wine safety and therefore must be addressed in the HACCP plan.

Hazard analysis and critical control points (HACCP) system: procedure that allows to identify, evaluate and control significant hazards for the wine chain of products.

HACCP plan: document prepared in accordance with the principles of the HACCP system, to ensure control of the hazards that are significant for wine safety.

Lot: defined quantity of a product produced and/or processed and/or packaged essentially under the same conditions. The lot is determined by parameters established beforehand by the organization and may be described by other terms, e.g. batch.

Operational Prerequisite Program (Operational PRP or oPRP): control measure or combination of control measures applied to prevent the occurrence of a significant wine safety hazard and for which an action criterion and a measure or observation allows effective control of the process and/or product.

Prerequisite Program (PRP): basic conditions and activities that are necessary within the organization and throughout the wine chain to maintain wine safety. The PRPs needed depend on the segment of the wine chain in which the organization operates and the type of organization.

Preventive measure: any activity or action that has the purpose of preventing a wine safety hazard or that its critical limit is not exceeded.

Probability/Frequency/Likelihood: magnitude of possibility occurrence of the hazard in the product.

Risk: A function of the probability of the occurrence of an adverse health effect and the severity of that effect, consequential to presence hazard(s) in wine.

Step: A point, procedure, operation or stage in the wine chain including raw materials, from primary production to final consumption.

Traceability: the possibility of finding and following the track - through all the stages of production, transformation and distribution of a wine.

Wine chain: sequence of the stages in the production, processing, distribution, storage and handling of a wine and its ingredients, from primary production to consumption.

Wine safety: guarantee system that wine will not cause an adverse health effect for the consumer when it is prepared and/or consumed in accordance with its intended

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use.

Wine safety hazard / Hazard: biological, chemical or physical agent in wine with the potential to cause an adverse health effect.

Wine Safety Management (or control) system (WSMS): The combination of preventive control measures; traceability, recall and communication as preparedness and HACCP plan defining CCPs and/or oPRPs as control measures linked to the production process. The WSMS is also the combination of control measures, surveillance and assurance activities. The latter aims at providing evidence that control measures are working properly such as validation and verification, documentation and record keeping.

3. Context and scope

This Guide is intended to harmonize the analyse of hazards and propose as orientative example the level of risk and the critical control points in relation to wine safety and hygiene pre-requisites that may occur during the steps of winemaking. This harmonization is convenient for OIV members and other countries and Institutions that have OIV as a reference,

At the organizational level, this document tries to highlight and solve a fundamental part of the WSMS. The Wine Sector of each country must apply it according its productive specificity.

And this Guide is open to the incorporation of new elements of risk when available scientific reasons or consumer protection makes it necessary.

Whereas Codex Alimentarius structures the HACCP system in 7 basic principles and 5 preliminary phases (see Annex 2), this Guide focuses on the determination of points 6 and 7, which correspond to Principle 1: "Hazard Analysis" and all Principle 2: "Determination of Critical Control Points (CCP)".

This Guide facilitates, according to the Codex Alimentarius, the determination of preventive measures, critical limits, monitoring systems, corrective measures and verification of the system, for each of CCP or oPRP found.

4. Objective:

- To raise awareness of the possible existence of hazards, risks and critical control points, as well as their control for production of safe vitivinicultural products for the health of consumers

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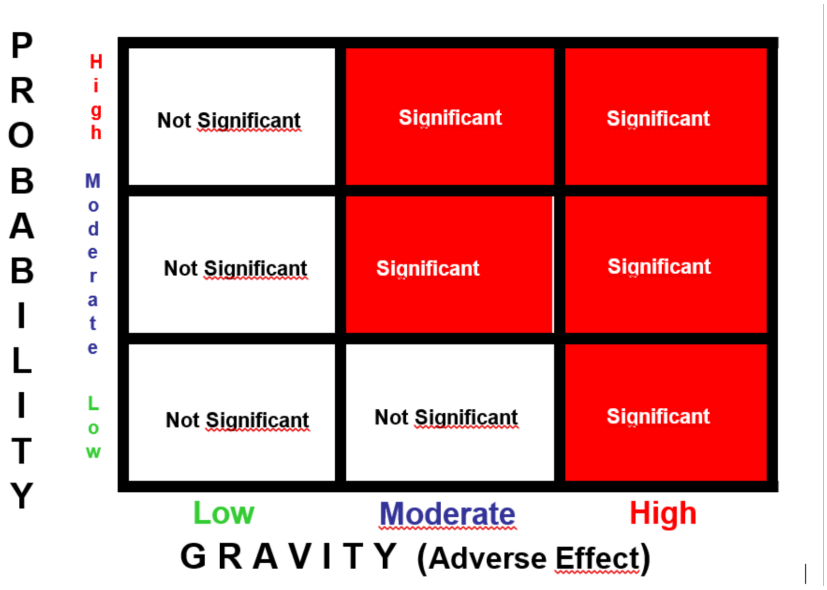
- To raise awareness of the producing companies and the Administrations of the implementation of the necessary measures to ensure, the wine safety including specific characteristics of the sector.
- To provide the priorities of the OIV to elaborate the corresponding specific Codes that identifies the control actions for each of the CCP or oPRP.

5. Implementation

5.1. Determination of Potential Hazards and Risks in wine production

Potential hazards may occur in every winemaking steps. The presence of contaminants, excessive residues, undesirable derivatives of naturally occurring substances, materials and chemical compounds may compromise food safety of vitivinicultural products. The potentials hazards agreed at the moment, are listed in Table 1.

Once the hazards are identified, it is necessary to assess the risk associated with each one of them in the production context. The assessment is done by the three-tier risk matrix for two factors: the gravity estimate and the probability of occurrence. The confluence of both factors gives the level of risk (significant or no significant) that exists (See the following figure).



5.2. Appreciations levels:

The risk assessment is made using the qualitative method and sustains some uncertainties related at ranking of the probability of occurrence and gravity related with each hazard (Appreciation).

Gravity/Severity/Adverse effect	
Appreciation	**Criteria (*)**
Low	There is minimal risk for the consumer related to wine safety (nature of hazard e.g. paper, soft plastic, large size foreign materials, chemical substances or microbes without health concern).
Moderate	No serious injuries and/or symptoms or only when exposed to an extremely high concentration during a long period of time. A temporary but clear effect on health (e.g. small pieces).
High	A clear effect on health with short-term or long-term symptoms which results rarely in mortality (e.g. gastro-enteritis). The hazard has a long-term effect; the maximal dose is not known (e.g. dioxins, residues of pesticides, and mycotoxins). Fatalities by a control failure and high risk would be rare

Probability/Frequency/Likelihood	
Appreciation	**Criteria (*)**
Low	The probability that the hazard will occur in the final product available to consumer is very limited. The control measures for the each hazard are of a general nature (PRPs) and these are related at PRPs;
Moderate	Failing or lacking of the specific control measure does not result in the systematic presence of the hazard in the end product but the hazard can be present in a certain percentage of the end product in the associated batch.

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High	Failure or absence of the specific control measure will result in a systematic error, there is a high probability that the hazard is present in all end products of the associated batch.

(*) Adaptation of Official Journal EU-2016/C, 278/01 (See Normative References).

Each country or organisation taken account their own process and historical data about one determinate hazard can modify the level of Appreciation of Probability and the consideration of Risk associated. The Table 1 can be taken like example or indication in the absence of elements for all hazards.

Mutualization and simplification

To simplify the task of operators with similar processes or to comply with the same regulations, sectoral organizations or competent administrations are encouraged to carry out work to pool risk analysis steps, to identify compounds for which specific measures must be taken, implemented and detail effective measures

Table 1. Relationship of potential identified hazards in winemaking process: Still and sparkling wine (Annex 4)

Num. HAZARD	STAGE OF OCCURRENCE	GRAVITY	PROBABILITY	RISK	COMMENTS
1. Presence of undesirable, non-pathogenic microorganisms in equipment and usable inputs	Grapes production Reception of harvest Purchase/Reception of wine Cellar equipment Reception of Oenological additives and processing aids	Low	Moderate	Not significant	Contamination in containers, transport systems, winery equipment and usable inputs ...
2. Residues from vineyard: plant protection products and herbicides	Grapes production Reception of harvest	High	Moderate	Significant	
3. Residues of fats, oils, etc.	Reception of harvest Crushing Pressing Bottling Tirage	Low	Moderate	Not significant	Use of lubricants, (use only food quality) for mobile mechanisms in reception, harvest, crushing, pressing, ... and bottling

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4. Mycotoxins (like OTA) from grape fungus	Grapes production Reception of harvest Purchase/Reception of wine	High	Low	Significant	Significant in regions propitious to the development of ochratoxine producing fungi
5. Excessive concentration of metals or trace elements very toxic (lead,...)	Grapes production: environnement contamination Transport of harvest Reception of harvest Crushing Must clarification Alcoholic fermentation (A.F.) Fermentation and storage in vats of concrete uncoated, or equipment with non-food complements or not suitable for must or wine, paints and ceramics for non-food use, etc.	High	Low	Significant	The contamination produced at prefermentative steps may disappear in certain circumstances in the course of alcoholic fermentation. This contamination can originate at any stage of the processing process, mainly by use of obsolete and deteriorated equipment or not suitable for must or wine
6. Presence of low or non-toxic metals	Transport of harvest Reception of harvest Crushing Must clarification Alcoholic fermentation (A.F.) Reception of Oenological additives and processing aids Racking Clarification Tirage 2nd. Fermentation - Maturation	Low	Moderate	Not significant	May produce enrichment of metals such as copper, iron, calcium. Also by equipments with non-food attachments or not suitable for must or wine Attention to oenological additives and auxiliaries

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7. Contamination by cleaning and disinfection products	All stages of production: Reception of harvest Crushing Must clarification Alcoholic fermentation Malolactic fermentation Racking Clarification Cold stabilization Wine maturation/storage Filtration Bottling Tirage 2nd. Fermentation - Maturation) Degorgement Refilling	Moderate	Moderate	Significant	Only use products intended for the wine industry. It may occur at any stage of processing Cleaning products must be stored in controlled access places
8. Presence of foreign bodies	Reception harvest Originating from the harvest (vegetable remains, dust and material's vineyard) From mechanical equipment From the plug and others electrical equipment Tirage Filling/bottling	Moderate	Moderate	Significant	e.g.: wood, metal, glass, stones, etc.
9. Contamination by Bisphenol A and diglycidyl ether of Bisphenol	Must clarification Alcoholic fermentation Malolactic fermentation Wine maturation/storage	High	Low	Significant	Equipment coated with epoxy-phenolic resins deteriorated o epoxy-phenolic resins poorly cured or not suitable for must or wine that can releases their components

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10. Residues of refrigerants Monoethylene glycol (or ethane-1,2-diol) and Diethylene glycol (or 2-hydroxyethoxy)ethan-2-ol)	Must clarification Alcoholic fermentation Cold stabilization Degorgement	High	Moderate	Significant	Refrigeration circuits of must or wine deterioratedFavor the use of non-toxic substances such as propylene glycol, polyethylene glycol or anhydrous alcohol
11. Monopropylene glycol (or Propane-1,2-diol) waste and calcic or sodium brines	Must clarification Alcoholic fermentation Cold stabilization Degorgement	Low	Moderate-	Not significant	Refrigeration circuits of must or wine deteriorated
12. Presence of Ethyl Carbamate	Alcoholic fermentation Malolactic fermentation Wine maturation	High	Low	Significant	Originate in fermentation processes (mainly accompanied by thermal processes) and long maturations
13. Presence of biogenic amines	Malolactic fermentation Wine maturation	Moderate	Moderate	Significant	Originate in fermentations and maturation process (e.g.: histamine). Severity is limited to a people with food intolerance to biogenic amines
14. Presence of cyanide derivatives	Ferric stabilization with ferrocyanide	High	Low	Significant	Originated after treatment with potassium ferrocyanide. Treatment not usual

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15. Presence of Polycyclic Aromatic Hydrocarbons	Maturation in oak	High	Low	Significant	Originated from excessive toasting of oak to be in contact with wine. A degree of over toasting, mainly obtained by direct fire, could increase the frequency This contamination is also possible due to the presence of wildfire near a vineyard or winery
16. Presence of Phthalates, Nonylphenes compounds	Alcoholic fermentation Wine maturation/stockage Bottling	High	Low	Significant	From: Plastic Containers or (*) Equipment coated with epoxy resins containing phthalates deteriorated or (*) Plastic hoses deteriorated or (*) Plastic bottles and bag-in-box or (*) (*) not suitable for must or wine
17. Persistent organic compounds: biphenyl polychlorinated compounds, dioxins, furans	Maturation in oak Capped with cork	High	Low	Significant	From the environment could be incorporated into the oak wood and cork that would be in contact with the wine. Belong to the group of environmental contaminants

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18. Presence of glass splinters	Alcoholic fermentation Bottling Degorgement Refilling	High	Moderate	Significant	From bottles and bottling process. From breakage lighting equipment, thermometers for control fermentation (this very occasional)
19. Bottle explosion and uncontrolled or untimely expulsion of the plug	Maturation in bottle Bottle conditioning 2nd. Fermentation - Maturation Clarification in bottle Degorgement Manipulation during consumption Expedition	Moderate	Moderate	Significant	Problems due to excessive filling of the bottles and temperature changes during storage and transport
20. Sulphur dioxide in excess	Purchage/reception of wine Assembly Bottling	High	Low	Significant	Error in dosing of SO2 during the wine making and bottling process. Delay or non-starting alcoholic fermentation in sparkling wine making
21. Presence of allergenic substances	Clarification Bottling	High	Moderate	Significant	Severe reactions, in allergic people, by presence of: - clarifying proteins based on egg, milk and other agents with animal protein, wheat. - lysozyme - sulphur dioxide

5.3. Determination of CRITICAL CONTROL POINTS (CCPs)

After implementing the control measures to limit the risk of each hazard, it must proceed to identification of CCPs. This was carried out by applying the decision tree of the Codex Alimentarius, modified by criteria of ISO 22000: 2018 (E). This allows us to know if the hazards are to be managed alone as oPRPs or these operational programs with defined measures are needed to manage the critical limits of CCPs. (See Annex 3)

In Table 2, are related, as example or indication in the absence of elements, how should it be treated one hazard with significant risk: as oPRP and the preventive

measures to apply (PRPs) or CCP also possible to be managed by a preventive plan.

In many cases of risk significant implement suitably PRPs or modify the process or its conditions, without modifying the quality standards of product, is enough to avoid its treatment as CCP.

When determining whether the hazards are controlled by oPRP or CCP, it must be determined in turn what kind of preventive or corrective measures have to be taken to eliminate the hazard or lead below the critical limit, as well as monitoring criteria, acceptability conditions, follow-up procedures, verification measures, responsibilities and record keeping, , according the guidelines for HACCP of Codex Alimentarius.

Table 2.Suggestion of handling of hazards in winemaking process (still wine and sparkling wine)

Note: “Good Manufacturing Practices”, “The Workers' Training Plan” and “Traceability Control Plan” are GENERAL PREVENTIVE MESURES TO APPLY for all hazards related

HAZARD	SPECIFIC PREVENTIVE MEASURES TO APPLY	Hazard Treatment	
		oPRP	CCP
2. Residues from vineyard: plant protection products and herbicides	Good Agricultural and Viticultural Practices PRP: Suppliers Control Plan PRP: Cleaning and disinfection Plan	oPRP	--
4. Mycotoxins like OTA from fungus of grape	OIV Code of sound vitivinicultural practices in order to minimise levels of ochratoxin A in vine-based products (2005) Good Agricultural and Viticultural Practices PRP: Suppliers Control Plan PRP: Cleaning and disinfection Plan	oPRP	--

5. Contamination by excessive concentrations of heavy or light metals or trace elements	Good Agricultural and Viticultural Practices PRP: Suppliers Control PRP: Hygienic design for buildings, facilities and equipment PRP: Maintenance Plan for buildings, facilities and equipment PRP: Cleaning and disinfection Plan	oPRP	--
7. Contamination by cleaning and disinfection products	PRP: Cleaning and disinfection Plan PRP: Hygienic design for buildings, facilities and equipment For cleaning and disinfection products the critical limit is “not detectable” which is guaranteed by a once fixed cleaning and disinfection plan and is checked in certain time intervals.	oPRP	CCP
8. Presence of foreign bodies	Good Agricultural and Viticultural Practices PRP: Suppliers Control Plan PRP: Hygienic design for buildings, facilities and equipment PRP: Maintenance Plan for buildings, facilities and equipment The presence of foreign bodies is checked by visual inspection or other optical methods (e.g. X-ray). The critical limit is “no foreign body”.	oPRP	CCP

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9. Contamination by Bisphenol A and diglycidyl ether of Bisphenol	PRP: Hygienic design for buildings, facilities and equipment PPR: Maintenance Plan for buildings, facilities and equipment PRP: Suppliers Control Plan PRP: Cleaning and disinfection Plan	oPRP	--
10. Residues of refrigerants Monoethylene glycol and Diethylene glycol	PRP: Hygienic design for buildings, facilities and equipment PPR: Maintenance Plan for buildings, facilities and equipment	oPRP	--
12. Presence of Ethyl Carbamate	Good Agricultural and Viticultural Practices PRP: Suppliers Control Plan	oPRP	--
13. Presence of Biogenic Amines	OIV Code of good vitivinicultural practices in order to minimise the presence of biogenic amines in vine-based products Good Agricultural and Viticultural Practices PRP: Suppliers Control Plan	oPRP	--
14. Presence of Cyanide Derivatives	PRP: Hygienic design for buildings, facilities and equipment PRP: Maintenance Plan for buildings, facilities and equipment PRP: Suppliers Control Plan CCP depending on the products produced; critical limit – legal regulations	oPRP	CCP

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15. Presence of Polycyclic Aromatic Hydrocarbons	PRP: Suppliers Control Plan PRP: Cleaning and disinfection Plan CCP depending on the products produced; critical limit – legal regulations	oPRP	CCP-
16. Presence of Phthalates, Nonylphenolic compounds	PRP: Hygienic design for buildings, facilities and equipment PRP: Maintenance Plan for buildings, facilities and equipment PRP: Suppliers Control Plan PRP: Cleaning and disinfection Plan	oPRP	--
17. Persistent organic compounds: biphenyl polychlorinated compounds, dioxins, furans	PRP: Suppliers Control Plan PRP: Hygienic design for buildings, facilities and equipment PRP: Maintenance Plan for buildings, facilities and equipment PRP: Cleaning and disinfection Plan	oPRP	--
18. Presence of glass splinters from bottle	PRP: Maintenance Plan for buildings, facilities and equipment PRP: Suppliers Control Plan The presence of foreign bodies like glass splitters is checked by visual inspection or other optical methods (e.g. X-ray). The critical limit is “no foreign body”.	-oPRP	CCP

19. Bottle explosion and uncontrolled expulsion of the plug	PRP: Suppliers Control Plan PRP: Storage and transportation Plan Caused by carbon dioxide content as well as 2nd fermentation/maturation (critical limit - no explosion; definition of a maximum carbon dioxide pressure)	oPRP	CCP
20. Sulphur dioxide/Sulphites in excess	Good Agricultural and Viticultural Practices PRP: Maintenance Plan for buildings, facilities and equipment PRP: Suppliers Control Plan CCP depending on the products produced; critical limit – legal regulations	oPRP	CCP
21. Presence of allergenic substances (Clarifying and stabilizing with proteins based on egg, milk and wheat or with sulphur dioxide, ...)	Specific Clarification Code OIV PRP: Allergen Control Plan PRP: Labelling of Product Plan CCP depending on the products produced; critical limit – legal regulations	oPRP	CCP

The development of the management sheets is the responsibility of the business but also of the sectorial organizations or administrative institutions competent in each country. They know better than anyone the productive uniqueness and the possible dangers that may arise.

Annexs

Annex 1: Prerequisite Program (PRP).

Configure the hygiene system in a winery:

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- Hygienic design of buildings, facilities and equipment,
- Workers' training plan
- Good manufacturing practices
- Maintenance plan for buildings, installations and equipment
- Cleaning and disinfection plan
- Personnel hygiene plan
- Waste control plan
- Pest control plan
- Water supply control plan
- Storage and transportation plan,
- Complaint and recall management plan,
- Control of chemicals plan
- Labelling of product plan
- Traceability control plan
- Supplier control plan
- Allergen control plan

Annex 2. Structures of the HACCP system

The Codex Alimentarius, structures the HACCP system in 7 basic principles and 5 previous phases. All are obligatory in order to apply it correctly. These are:

1. Establishment of the HACCP working group
2. Description of activities and products
3. Identify the intended use of the products
4. Preparation of flowchart
5. Check Flow Chart

6. Hazard analysis and determination of preventive measures. Principle 1
7. Determination of critical control points (CCPs). Principle 2
8. Establishment of critical limits for each CCP. Principle 3
9. Establishment of a monitoring system for each CCP. Principle 4
10. Adoption of corrective measures. Principle 5
11. Checking the system. Principle 6
12. Establishment of a documentation and registration system. Principle 7

Annex 3: Decision tree to recognize a PRP, oPRP or CCP

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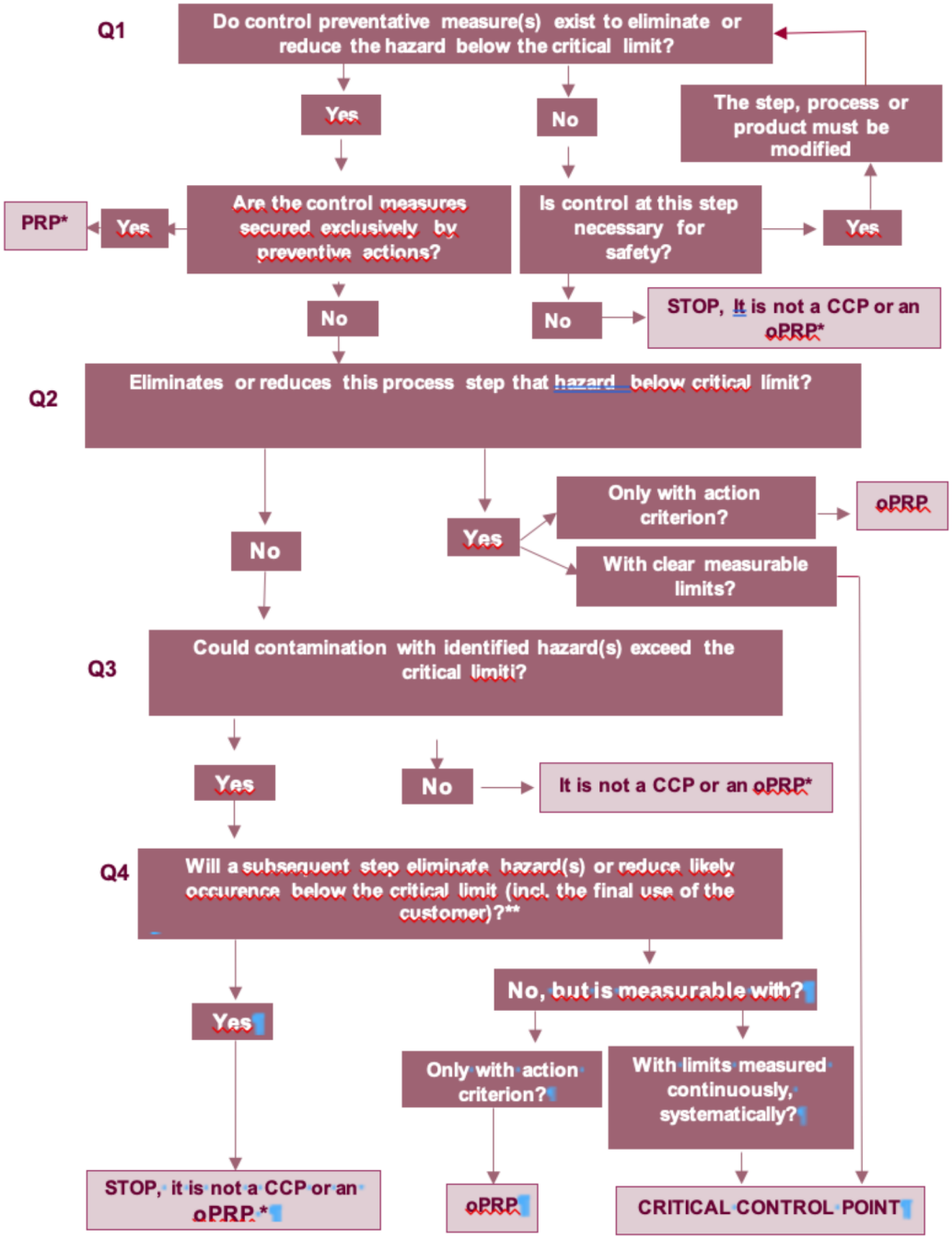

* Go to the next identified hazard of the winemaking process.

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Annex 4: Flow Diagram

These diagrams are illustrative and simplified. It is possible that some step is not carried out or has some modification or is not adapted to the specificity of the winery.

Annex 4a: White wine process

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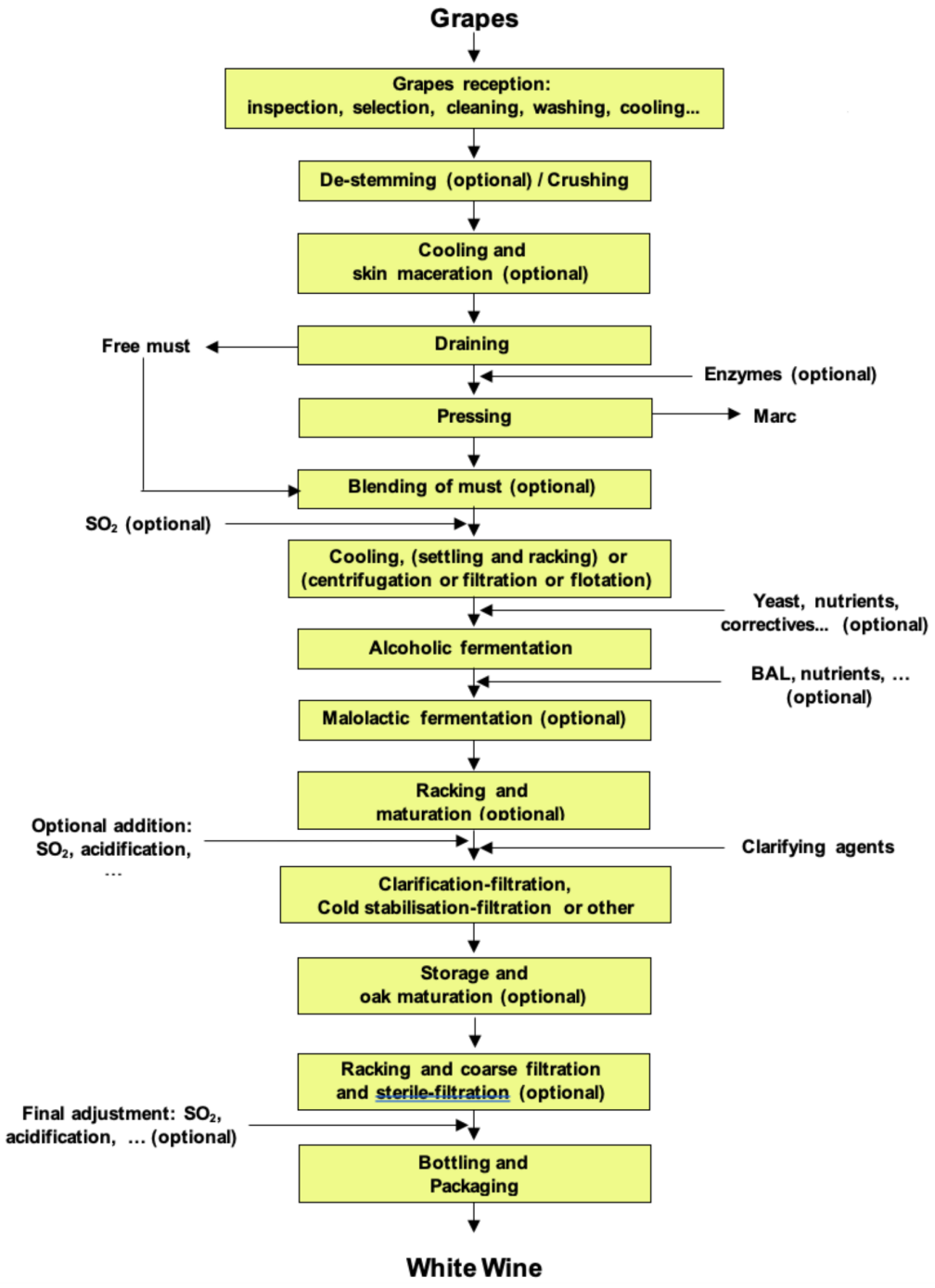
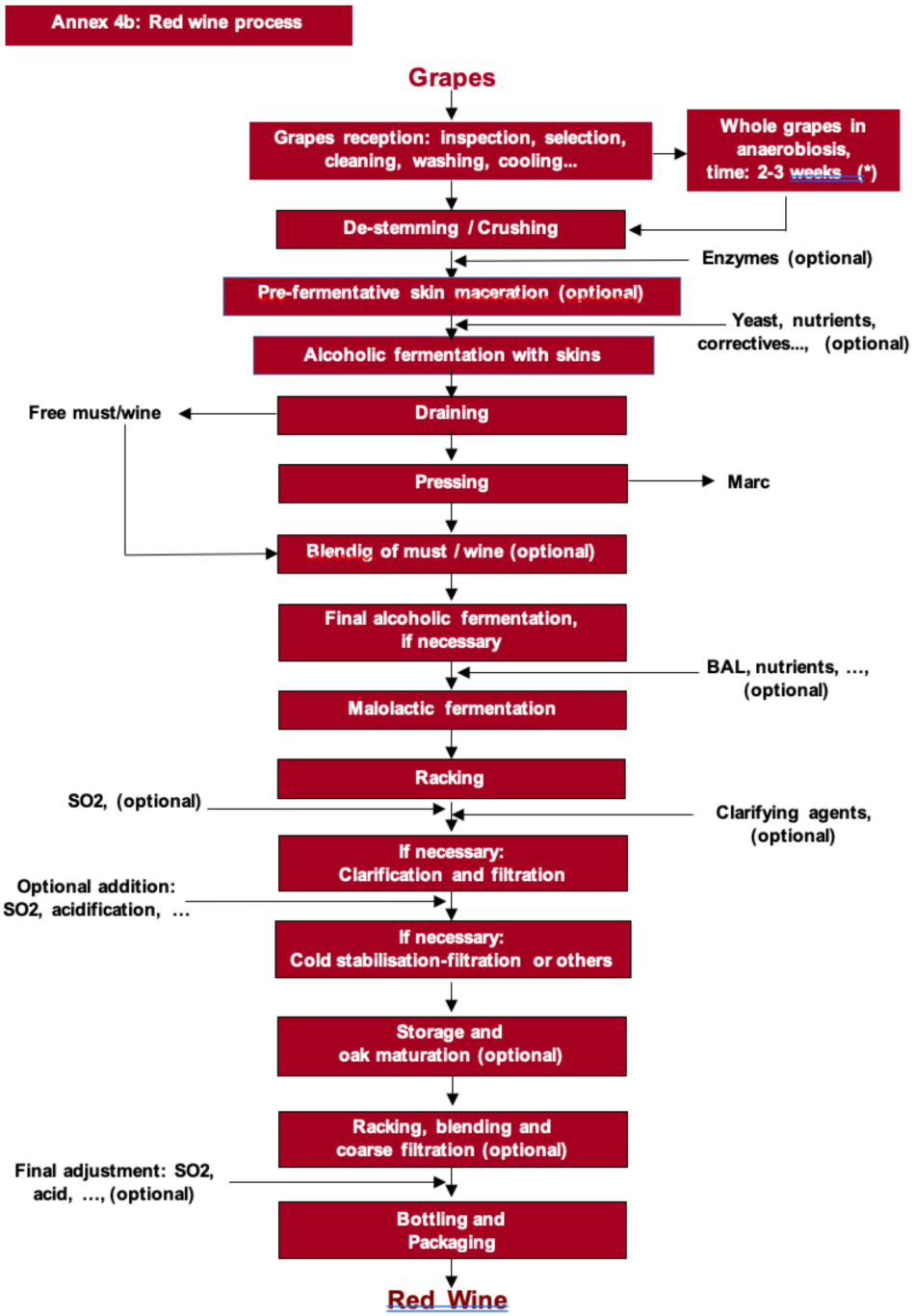

Grapes
Grapes reception: inspection, selection, cleaning, washing, cooling...
De-stemming (optional) / Crushing
Cooling and skin maceration (optional)
Free must
Draining
Enzymes (optional)
Pressing
Marc
Blending of must (optional)
SO2 (optional)
Cooling, (settling and racking) or (centrifugation or filtration or flotation)
Yeast, nutrients, correctives... (optional)
Alcoholic fermentation
BAL, nutrients, ... (optional)
Malolactic fermentation (optional)
Racking and maturation (optional)
Optional addition: SO2, acidification, ...
Clarifying agents
Clarification-filtration, Cold stabilisation-filtration or other
Storage and oak maturation (optional)
Racking and coarse filtration and sterile-filtration (optional)
Final adjustment: SO2, acidification, ... (optional)
Bottling and Packaging
White Wine

Annex 4b: Red wine process



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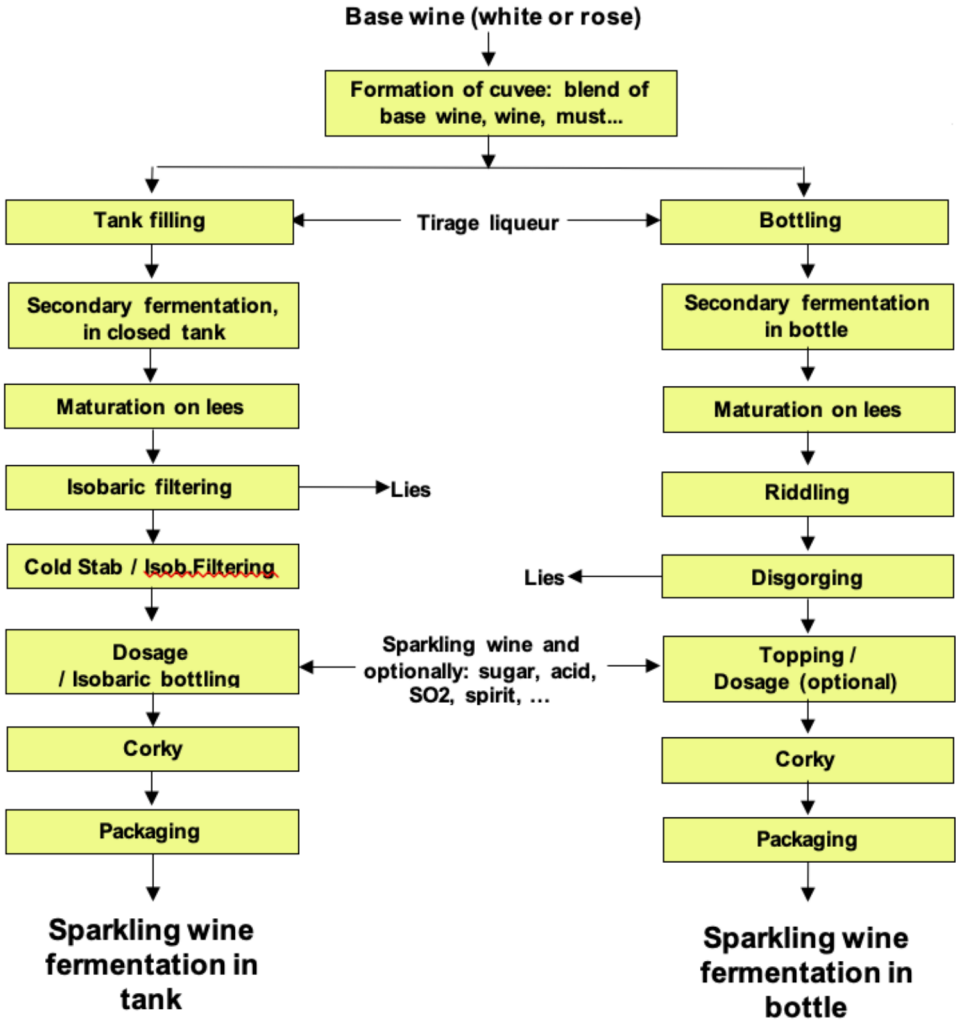
Annex 4c: Sparkling wine process



Certified in conformity Paris videoconference, 26th November 2020
The Director General of the OIV
Secretary of the General Assembly
Pau ROCA