

# The Standard Drink in Mexico

$p = m/v$



A tool for the prevention  
of harmful use of alcohol



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harmful use of alcohol



## **CHARTER MEMBERS**

Antonio Ariza Cañadilla †

Emilio Azcárraga Milmo †

Nazario S. Ortíz Garza †

## **HONORARY PRESIDENTS**

Antonio Ariza Cañadilla †

Emilio Azcárraga Milmo †

Isaac Chertorivski Shkoorman

Nazario S. Ortíz Garza †

Manuel Rubiralta Díaz †

## **WHAT IS FISAC?**

Back in the 1980s, a group of committed businessmen got together, under one goal: They wanted to coordinate their goals as social actors, committed to the development of their country. That is how, as of September 10th 1981, the Social Investigations Foundation (Fundación de Investigaciones Sociales, A.C.) came to be. It serves as a hub that coordinates efforts of different researchers and specialists in different matters, in order to create up-to-date programmes and to scientifically validate their strategies focused on promoting responsibility concerning alcohol use.

Along with these businessmen, the interdisciplinary group of professionals that work at FISAC, have agreed on the importance of actions when dealing with avoiding harmful use of alcohol. We are fully committed with Mexico, and as such it is with a deep sense of responsibility that we actively contribute to promoting a healthy lifestyle, as well as risk prevention.



**FUNDACIÓN DE INVESTIGACIONES SOCIALES, A.C.**  
**(Social Investigations Foundation)**

**MISSION STATEMENT**

Promote a cultural shift within society concerning the accountability and responsibility in alcohol consumption, through health and life skills education.

**GUIDING PRINCIPLES**

No drinking and driving  
No alcohol use by underage individuals  
Respect for non-drinkers  
Moderation

**BOARD MEMBERS**

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Bodegas la Negrita  
Casa Herradura - Brown Forman  
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Pernod Ricard Mexico

**Author:** Esteban Nolla Hernández

**Joint authors:** Jessica Paredes Durán and Diego Velasco Ureña

**Editors:** Francisco Javier González Almeida, María Salomé Pérez Granados and Adriana Rojas Ruíz

**Editorial design and computer graphics:** Alejandro Nolla Hernández

**Cover design:** Gladys Adams Medina

**Translation:** Marie-Claude Xochiquetzalli Sabourin Arellano

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A tool for the prevention of harmful use of alcohol"

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—*Esteban Nolla Hernández*

# **FOREWORD**

For over 15 years, at FISAC we've worked with the concept of a standard drink because of its importance in preventing the harmful use of alcohol. That is why we decided to go back to its origin, immerse ourselves in its depths and practical applications. We know this is only the starting point for other publications and creations. We hope that more specialists become interested, research and talk about this, this way we can join efforts in creating a culture of responsibility regarding alcohol use.

The standard drink is a concept that has been implemented in many countries, however, everyone has a different measurement, according to their culture, the biological traits of their inhabitants and geography, among other factors. In Mexico, there have been many attempts to establish a unit of measurement, as we'll see further along.

In this book we hope readers will have a better understanding of the concept and its importance, thanks to a quick trip through history and its implications in other areas of knowledge regarding prevention.

In each chapter, we will explore different pieces of information that will, by the end, give us a complete understanding of the standard drink. In other words, we will go through basic information that we must know to be able to use the standard drink; followed by a bird's eye view through History; and ending in its formulas and



applications, along with some proposals for its use in preventing a harmful use of alcohol.

We decided to use graphic aids throughout the text to make it lighter to read, didactic, and easier to understand and consult the minutiae of data shown.

The content and vision of this text aligns with FISAC's guiding principles: No alcohol use in underage individuals; no drinking and driving; respect for non-drinkers; and last but not least, moderation in alcohol use by healthy adults.

Lastly, I wish to thank each and every member of the Department of Community Services (DSC), who have made this work possible; especially to Esteban Nolla, who is the author of this book.

Also, thanks to our Board Members, for they materialise our dreams and keep the passion for our work alive.

—*Jessica Paredes Durán*

# INDEX

## **12** PART ONE

**13** Introduction

**17** 1. What is ethanol?

**19** 2. How are alcoholic beverages made?

**23** 3. How are alcoholic drinks defined and classified?

**28** 4. Identify the information on your container

**35** 5. What is the Standard Drink used for?

**39** 6. Background

**48** 7. Standard Drink around the world

**57** 8. The Standard Drink in Mexico

**63** 9. How is the value of the Standard Drink determined?

**65** 10. How do we serve or have a drink in Mexico?

**69** 11. Formulas and applications

**79** 11.1 *Per capita* consumption and the Standard Drink

**83** 12. What is a harmful use of alcohol ?

**86** 13. What is considered to be excessive use or abuse?

## **89** PART TWO

**91** 14. What are the pharmacokinetics of ethanol?

**94** 15. What is the pharmacodynamics of ethanol?

**97** 16. Blood alcohol concentration or content (BAC)

<b>102</b>	17. Why is it so dangerous to drive under the influence of alcohol?
<b>104</b>	17.1 How does the breathalyser work?
<b>107</b>	18. Intervening factors in ethanol's effect on the organism
<b>116</b>	19.The Standard Drink in connection with nutrition
<b>120</b>	20. Underage drinking
<b>124</b>	21. Women and the Standard Drink
<b>126</b>	21.1 Alcohol consumption during pregnancy or nursing
<b>128</b>	22. Men and the Standard Drink
<b>131</b>	23. Older people and the Standard Drink
<b>134</b>	24. Effects responsibility and moderation have on alcohol use
<b>137</b>	25. Life skills and tools
<b>145</b>	26. Exercises
<b>148</b>	27. Annex. Types of drinks
<b>153</b>	28. Glossary
<b>158</b>	29. Bibliography

# 1

Part  
one

## INTRODUCTION

The Standard Drink (SD) or Standard Unit of Beverage (SUB) is a unit of measurement used to determine a fixed amount of pure ethanol in each drink. Establishing and knowing how to use said measurement gives us the opportunity to quantify exactly how much a person or population drinks, which is indispensable in screening tests and surveys (e.g., Early Detection of Problem Drinkers), to establish healthy limits in Universal, Selective or Indicated Prevention Programmes, and some treatment modalities (e.g., Reduction of the amount of drinks ingested) and for research purposes, among others. As we will see throughout the text, we need to take into account several factors to fully comprehend and correctly use the SD in its different application possibilities.

It's necessary to point out that the value given to the SD is not universal, because of this it is not uncommon to find variations in the amount of pure ethanol considered, according to the country of origin or the research paper we read. Another factor that *apparently* complicates the use of the SD, is that there is a large number of alcoholic beverages with different concentrations, depending on whether they're fermented, distilled, or both; not to mention the differences among themselves. Furthermore, drinks are sold by the shot, can, bottle, barrel, or others, and this could complicate knowing the exact amount of standard drinks each presentation

has, which in turn would allow us to know the exact ethanol intake. This is one of the reasons why the container in which each beverage is served is important since it can help us know how much we're drinking. The higher the alcohol concentration, the smaller its container, such as a shot glass, or an *old fashion glass*; red, white, rose, and bubbly wine all have different glasses, and beers have their different mug sizes. That said, it is through the use of the SD that calculations may be made to know what makes up a drink, based on its alcohol content, or just how many SD are in each beverage presentation. This, in turn, helps set precise guidelines, oriented at health risk prevention and at making information accessible to the general public.

It is important to notice, as Marjana Martinic (1998) mentions, that even when the concept of a Standard Drink is clear enough, the way in that it is applied in different countries can be somewhat confusing since different values are used from one country to another. The great differences that exist among countries when determining the content of pure alcohol of the Standard Drink, is determined -in good measure-by local customs, traditional drinks, and the way to drink them. Due to this, it is complicated to establish international limits when carrying out studies or comparisons; in connection with this, the Pan American Health Organization (PAHO) points out in its "International guide for monitoring alcohol consumption and related harm" (2000) that: "For the purpose

of estimating actual alcohol consumption, whether from survey or sales data, the critical issue is whether the standard drinks employed by either health educators or researchers relate to actual drinking behaviour. Turner's study (1990) revealed great variation in estimates of standard drink sizes both within and between countries. It cannot be assumed that definitions of standard drinks used in health education campaigns are accurate reflections of what people actually drink." This shows us the necessity and the convenience of reaching an official consensus in the value of a Standard Drink within our country. As Sabines Torres mentions (in: CIJ 2010): "The use of standard drinks simplifies evaluating alcohol intake and can be adopted in a systematic fashion in primary attention health centers. However, since there are differences among countries, each country should determine the alcohol content in a standard drink not only by consensus, but by means of scientific studies (PAHO 2008)."

We will see throughout this text, some of the many applications that the Standard Drink can have not only for alcohol-related research, but also in preventing its harmful use.

Its formalization can bring benefits to the population in the sense that it can help promote a cultural shift toward the responsibility in consumption. Thus, making this knowledge is a key protective factor that avoids risky consumption for healthy adult men and

women that decide to drink alcoholic beverages, while, at the same time contributing to construct a clear, well-based concept of moderation in consumption.



## WHAT IS ETHANOL?

Ethanol is a colourless, volatile, and flammable compound whose chemical formula is  $\text{CH}_3\text{-CH}_2\text{-OH}$  ( $\text{C}_2\text{H}_6\text{O}$ ), which indicates that it has two carbon atoms (C), six hydrogens (H) and one oxygen (O). It has a molecular weight of 46.07 and its density is 0.785g/ml at a temperature of 25°C. Ethanol is naturally produced through alcoholic fermentation, which is a metabolic process by means of which carbohydrates break down under anaerobic conditions (in absence of oxygen). Fermentation is carried out by certain types of microscopic unicellular fungi, yeast. Given their small size, ethanol molecules are able to cross cellular membranes by means of simple diffusion. This property allows ethanol to cross stomach mucous easily, thus reaching the blood stream directly, without necessity of being digested or degraded previously (see pharmacokinetics).

The word "alcohol" is usually used to refer to the content of different drinks that are produced for general consumption. Therefore, "alcohol" and "ethanol" have come to be used interchangeably as if they were exactly the same thing. It is important to know that the only alcohol suitable for human consumption is ethanol of agricultural origin, once it has been purified and separated from other substances that could be detrimental to health, as we will see in the following section.

# What is Ethanol?

It is a compound



Colourless



Volatile

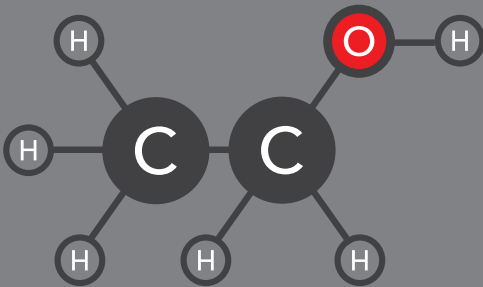


Flammable

## Its chemical formula

$\text{CH}_3\text{-CH}_2\text{-OH}$

it has two Carbon (C) atoms,  
six Hydrogen (H) atoms and one Oxygen (O) atom.



At a temperature of 25°C



its density is of 0.785g/ml



The word 'alcohol' is used to refer to the content of different drinks produced for consumption. Therefore, 'alcohol' and 'ethanol' are used interchangeably.

It is the only kind of alcohol suitable for human consumption, once it has been purified and separated from other substances that might be a health hazard.

## HOW ARE ALCOHOLIC BEVERAGES MADE?

As we have mentioned, ethanol is the only alcohol suitable for human consumption. Due to this, those producing alcoholic drinks are obligated to meet high standards of quality and hygiene in their elaboration processes as stated in many regulations of our country. The fulfillment of these laws and regulations have the purpose of guaranteeing that these products won't damage the consumer population's health.

The making of any drink, either fermented or distilled, begins with the cultivation of the raw materials, from which a variety of drinks will be obtained, for example, grape for wine, sugar cane for rum, wheat or potato for vodka, agave for tequila, and barley for beer, among many others.

Once the raw material is obtained, it undergoes specific procedures. Each drink requires a distinct set of steps, since these will be responsible for the variations in the flavour and aroma of the drinks. The whole process can be regulated, for example, by way of a recipe that will give a specific and characteristic touch to a certain product: Once tequila producers (*tequileros*) select the plants of the variety of agave known as Blue Tequilana Weber, cultivated inside the area protected by the Tequila Guarantee of Origin, they eliminate the leaves or '*pencas*' (this is known as '*jima*') to obtain the heart or '*pineapple*'. This is then cooked to hydrolyse the carbohydrates until simple sugars are obtained (these simple sugars can be used by yeast to carry out the fermentation). Later

on, the sugars are extracted or separated from the fiber or marc of the agave.

Once the juice of any raw material is extracted, it goes to fermentation. Those devoted to the formal production of alcoholic drinks, select the kind of yeast, and ingredients to obtain the wanted reactions; this will affect the amount of alcohol contained in the drink as much as its flavor and aroma. The obtained juice is filtered to eliminate deposits, yeast is added, and the temperature and sugar concentration are adjusted. The final product of this operation is known as must or wort. It's worth mentioning that throughout the whole process, temperature, cleanliness, and fermentation time are controlled.

In the case of distilled beverages, once the fermentation is concluded, the next step is the distillation process that is carried out in copper or steel stills or in distillation columns. When the must or wort is brought to a boil, the ethanol separates from other more and less volatile substances. The captured vapors are then cooled through tubes and condensed for the collection in another container. This is how drinks with a higher concentration of alcohol are obtained, since ethanol is separated from water and other compounds. Distillation is a critical process because, on the one hand, what is desired is concentrating the alcoholic content through the elimination of water and solid particles that could be in the must or wort. On the other hand, the separation of unwanted compounds, either for their aroma or scent, or because they present a health risk for consumers, is also a primary objective. Among the substances that are undesired, there are alcohols not suitable for

human consumption, such as methanol, as well as other undesirable substances like aldehydes. It is possible to separate ethanol from methanol and other substances because their physical-chemical characteristics are different, such as: boiling point temperature, molecular weight, and evaporation point. It is in this sense that distillation can be divided into three well-known parts known as heads, hearts and tails.

The head, as it is known, consists of the initial vapors of the distillation that are mainly made up of compounds with lighter molecular weights and of lower boiling points. The heart is the middle part of the distillation and consists of the drink proper, while the tails correspond to the final part of the distillation and consist mainly of compounds with heavier molecular weights and higher boiling points than that of ethanol.

Depending on what characteristics are wanted, alcoholic drinks, fermented or distilled, can be kept in casks where they will rest as necessary. The casks also intervene in giving color, flavor and aroma to the drinks. Finally, they are packed and distributed for their sale to the public.

Just like the elaboration processes, those of distribution and sales are subject to norms that guarantee the quality and legality of the products.

# How are alcohol drinks produced?

The elaboration process of any drink, be it fermented or distilled, starts with the harvesting of the raw material.



Fruit



Maguey plant



Grains

Once the raw material is collected, it undergoes specific treatments; each drink requires different procedures since this will produce nuances in flavor and aromas of said drinks.

## Fermentation

Once the must or wort is extracted from any raw material, it is fermented. In this step yeast and other ingredients are selected to obtain different reactions, this will also affect the alcohol content of the drink, as well as its flavour and aroma.

## Distillation

Once the fermentation is finished, the distillation begins, this is produced in copper or steel stills or in distillation columns. When the must or wort reaches its boiling point, ethanol separates from other more and less volatile substances. The captured vapors are then cooled through tubes and condensed for their collection in another container.

## Aging and Storage

Once the fermented or distilled product desired is obtained, it is kept in casks where it will age as necessary. The casks also intervene in giving colour, flavour and aroma to the drinks.



## **HOW ARE ALCOHOLIC DRINKS DEFINED AND CLASSIFIED?**

The laws, regulations and norms of Mexico define, among other things, what is understood as an alcoholic drink and how it is classified based on its characteristics. Knowing the legal framework is important in order to inform and to protect the public from possible health risks, to avoid disloyal practices against formal producers of alcoholic drinks, and to maintain the legality and quality of the products.

Article 217, of the General Health Law specifies that "alcoholic drinks are considered to be those that contain ethyl alcohol in a proportion of 2% and up to 55% in volume. Anything surpassing this percentage cannot be marketed as a beverage."

Article 175, of the Regulation of Sanitary Control of Products and Services, specifies that alcoholic drinks can be classified as follows:

- I. Fermented drinks;
- II. Distilled drinks;
- III. Liquors, and
- IV. Prepared alcoholic drinks and cocktails.

Article 176, of that same regulation, states that alcoholic drinks can be classified according to their alcoholic content as:

1. Of low alcohol content, if the drink contains between 2 and

6% alcohol by volume (ABV); 2. Of medium alcohol content, if the drink contains between 6.1 and 20% ABV, and 3. Of high alcohol content, if the drink contains between 20.1 and 55% ABV.

In turn, the Official Mexican Norm NOM-142-SSA1 /SCFI-2014, establishes the following definitions for different types of drinks:

- **Fermented alcoholic drink**, it is the resulting product of a mainly alcoholic fermentation of raw materials of vegetal origin; other ingredients and preservatives may be added as long as they are allowed by the *"Agreement in which ingredients and preservatives are determined for foods, drinks and nutritious supplements, their use and sanitary dispositions"*. With alcoholic content of between 2.0 and 20.0% ABV.
- **Distilled alcoholic drink**, it is the product of distillation of fermented liquids that have been elaborated from raw vegetal materials in which the entirety or a part of their fermentable sugar, have gone through a mainly alcoholic fermentation, provided the distilled product has not been totally rectified; the product must contain the secondary substances formed during fermentation and that are characteristic of each drink, with the exception of vodka, they can be served directly or matured if needed; other materials and preservatives may be added as long as they are allowed by the *"Agreement in which ingredients and preservatives are determined for foods, drinks and nutritious supplements, their use and sanitary dispositions"*. With alcoholic content of between 32.0 and 55.0% ABV.



- **Prepared alcoholic drinks**, are products elaborated with the help of distilled or fermented alcoholic drinks, liquors, or mixtures thereof, neutral spirits, common alcohol, or a mixture of them and water, that are perfumed and flavoured according to specific procedures, and to which other ingredients and preservatives may be added as permitted by the *"Agreement in which ingredients and preservatives are determined for foods, drinks and nutritious supplements, their use and sanitary dispositions"*. With an alcoholic content of between 2.0 and 12.0% ABV.
- **Cocktail**, is a product elaborated with distilled or fermented alcoholic drinks, liquors or mixtures thereof, neutral spirits, common alcohol, or a mixture with water, that is perfumed and flavoured with specific procedures and to which other ingredients and preservatives may be added as permitted by the *"Agreement in which ingredients and preservatives are determined for foods, drinks and nutritious supplements, their use and sanitary dispositions"*. With an alcoholic content of between 12.0 and 32.0% ABV.
- **Liqueur or Cream**, are products elaborated with the help of a distilled alcoholic drink, neutral spirits, quality alcohol or common alcohol or a mixture thereof, with sugar and water content of no less that 1.0% (m/v), that are perfumed and flavoured through specific procedures, and to which other ingredients and preservatives may be added as permitted by the *"Agreement in which ingredients and preservatives are determined for foods, drinks and nutritious supplements, their*

*use and sanitary dispositions*". With alcoholic content between 13.5 and 55.0% ABV.

It is necessary to remember that in addition to what we have seen thus far, there are numerous norms, laws, and regulations related to alcoholic drinks, and these encompass sanitary, commercial, advertising, fiscal, and economic aspects, among others. Also, they can be federal, state or municipal, therefore, it is necessary to go through the particular legal framework of each region of the national territory.

# HOW ARE ALCOHOLIC BEVERAGES DEFINED AND CLASSIFIED?

## DISTILLED ALCOHOLIC BEVERAGES



Between 32.0 and 55.0% ABV.

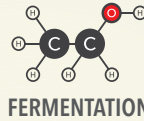
## FERMENTED ALCOHOLIC BEVERAGES



+



=



Between 2.0 and 20.0% ABV.

## READY TO DRINK ALCOHOLIC BEVERAGES



Between 2.0 and 12.0% ABV.

## COCKTAIL



Between 12.0 and 32.0% ABV.

## LIQUEUR OR CREAM



Between 13.5 and 55.0% ABV.

## **IDENTIFY THE INFORMATION ON YOUR CONTAINER.**

Throughout this document, we will be continually referencing the percentage of alcohol by volume (ABV) in the many alcoholic drinks that are offered on the market. In Mexico, this percentage of alcohol is indicated on all containers as "% Alc. Vol." and it is a very important piece of information needed to understand everything related to the Standard Drink. This percentage of alcohol indicates the total amount of pure alcohol that our drink contains (see *Formulas and Applications*). The volume of the container is usually labelled with "CONT. NET." (Net content) and the amount of milliliters it contains, e.g., "750ml."

For the regulation of any type of formal beverage, be it national or imported, the "NOM-142-SSA1 / SCFI-2014. GOODS AND SERVICES. ALCOHOLIC BEVERAGES. SANITARY SPECIFICATIONS. SANITARY AND COMMERCIAL LABELLING." exists. Here, indispensable requirements that all alcoholic beverages that are marketed in the national territory should cover, are specified.

In Infograph 4, we present fictitious labels of an imported rum in which all the elements required by this Norm are indicated. We point out the data that will be useful in other chapters to obtain the SD.

In Infograph 5, we can see the elements that should be on a label for a bottle of Tequila, and we point out where we will usually find this information, although it might vary depending on design; however, this information must always be visible by law. In the specific case

of Tequila, that has a guarantee of origin<sup>1</sup>, the producers also have to adhere to NOM-006-SCFI-2012, ALCOHOLIC BEVERAGES-TEQUILA-SPECIFICATIONS, that define the terms and mark the official requirements to consider a drink Tequila, from the necessary ingredients, to the production, packaging and labelling processes. As can be observed, our label has all the official elements specified in the Norm.

On the other hand, section 9.3.7.2.4 of the NOM-142-SSA1 / SCFI- 2014 establishes that all alcoholic beverages should include the following three symbols in combination or individually:



The exception to this are beverages of low alcohol content, in which only the following symbol must be included:



This information points out that the consumption of any alcoholic drink, in any quantity, is highly unrecommended for minors, pregnant women, and people that will be driving a vehicle, because of the possible harm that this could cause. All the specifications and requirements to add these symbols are covered in the section previously mentioned of NOM-142-SSA1 / SCFI-2014.

1 According to Article 156 of the Law of the Industrial Property "Guarantee of Origin can be understood as the name of a geographical region of the country that is used to designate a product native of that region, and whose quality or characteristics are due exclusively to the geographic area, considering in this both the natural and human factors."

# Identify the information on your container

For the regulation of any type of formal beverage, be it national or imported, the "NOM-142-SSA1 / SCFI-2014. GOODS AND SERVICES. ALCOHOLIC BEVERAGES. SANITARY SPECIFICATIONS. SANITARY AND COMMERCIAL LABELLING." exists. In it, mandatory requirements that all alcoholic beverages that are marketed in the national territory should cover, are specified.



# Beverages with guarantee of origin

In the specific case of Tequila, that has a guarantee of origin, the producers also have to adhere to the NOM-006-SCFI-2012, ALCOHOLIC BEVERAGES-TEQUILA-SPECIFICATIONS, that defines the terms, and marks the official requirements to consider a drink as Tequila



## REGARDING THE LABEL

The label, also known as the “treasury seal”, is a label, an identifying and fiscal control sign that certifies the origin, quality, and legality of products, in this particular case, of alcoholic drinks.

Since the year 2013, labels of all alcoholic drinks must have a QR code (Quick Response Code) that can be scanned through an app (software) for telephones or smart devices that have Internet access. People can read this code before buying a bottle, when doing so, they will be forwarded to the *Servicio de Administración Tributaria* (SAT; Tributary Administration Service) website, where they will be able to see the information pertaining to that label and that bottle in particular. This gives the opportunity to corroborate that the label type (be it a national or imported product), the folio number, the name of the product, the alcoholic content, the container’s capacity, the country of origin and the lot number, among other outstanding data, correspond to the bottle scanned.

Additionally, the labels have distinctive security elements that are necessary to know, because they constitute a civic instrument that has the purpose of guaranteeing to consumers that the product they are acquiring is original and has been regulated by laws and regulations. In the case that the information doesn't correspond or if an irregularity is noticed, it is important to bring it to the attention of the authorities by writing to [denuncias@sat.gob.mx](mailto:denuncias@sat.gob.mx), and including the most outstanding data of the bottle and label, as well as the date and the place where the product was acquired.



The subsequent image shown details the security elements that characterize original labels.<sup>2</sup>

It is recommended that after verifying a product's authenticity, the label be torn or destroyed, before disposing of it so as to avoid its undue use<sup>3</sup>.

---

2 This information was extracted from the following website:

[http://www.juntoscontralailegalidad.mx/verifica\\_botella.html](http://www.juntoscontralailegalidad.mx/verifica_botella.html)

3 For further information on the inner workings and impact of the informal market, consult the document "Historia de una botella adulterada" (*"Story of an adulterated bottle"*) 2015.

# REGARDING THE LABEL

They have an element that changes color. To better observe this security element it is recommended that you place it in front of you, horizontal to your line of sight and then rotate or incline it.

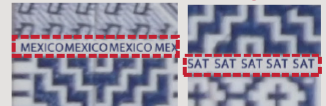
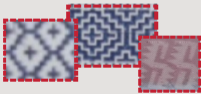
They have embossments perceivable by touch.

The embossed area has ink that stains when rubbed.

Their design includes different Pre-Columbian motifs, such as fretworks of the archaeological site of Mitla.

They include microtexts that are not easily readable at first sight. At the topmost part you will find the word **MEXICO** and the initials **SAT** at the bottom.

It has a scannable QR code and a folio that you can verify at [sat.gob.mx](http://sat.gob.mx)



**GREEN LABEL**

National drinks



**BLUE LABEL**

Imported drinks

## WHAT IS THE STANDARD DRINK USED FOR?

The "International guide for monitoring alcohol consumption and related harm" published by the Pan American Health Organization (PAHO 2000) says that, "The interchangeable terms 'standard unit' and 'standard drink' are important concepts for both alcohol research and other public communication of health information about drinking."

"A 'unit' or 'standard drink' of alcohol has become a central concept in alcohol education campaigns over the past two decades in many parts of the world. Whenever advice is given to the public regarding Low Risk levels of use, whether for general health or safety reasons, almost invariably levels of daily and/or weekly alcohol consumption are provided in 'units' of alcohol, 'standard drinks' or just 'drinks'. [...]

"Standard drinks or units of alcohol are also employed by researchers to communicate results of drinking surveys." As can be observed, the "Standard Drink" or "standard unit of drink" is a concept that is mainly used internationally, with three purposes:

1. **To carry out studies:** When surveys are made about how much a certain population drinks, this is measured in terms of number of drinks (e.g., How many drinks do you usually consume?). For these purposes, it is necessary to establish what is understood as a "drink", since a tequila shot glass won't be the same as a bigger glass with more pure alcohol. The enormous variation

that exists among the different containers used for drinking and the different concentrations of ethanol in each drink, complicate establishing what 'a drink' means. Therefore, a necessity to determine an exact amount of pure alcohol per drink is created, in order to quantify how many drinks and how much pure alcohol any given population is consuming.

2. **To produce guidelines:** Once a Standard Drink is defined as such in any given region or country, the corresponding conversions can be made and related to what constitutes moderate consumption. Usually the amount of ethanol is expressed in grams. For example, according to Medina Mora (2013), a low risk use is considered as no more than 36 grams of ethanol a day in intervals of at least 1 hour between each glass<sup>4</sup>, with at least 1 or 2 days of abstinence to allow the liver to rest. Therefore, the variation of the amount of alcohol that the Standard Drink has in different countries should be taken into account, in order to give alternatives and to help excessive drinkers reduce their intake.
  
3. **In the prevention of harmful drinking:** The purpose of explaining the Standard Drink to the general public is to give them basic information so they may avoid risky behaviour, and, if they have decided to consume alcoholic drinks, they do so without excess so they don't expose themselves to possible harm to their health. Counting drinks can be helpful so people can adhere to recommended guidelines with the certainty that they are being responsible in their consumption of alcoholic drinks.

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4 Based on: Medina Mora, 2013.

In "What is a Standard Drink?" by the International Center for Alcohol Policies (ICAP; 1998) we find: *"From the public health perspective, the concept of a 'standard drink' was introduced as a means of advising the public whether they are drinking within reasonable thresholds for avoiding potential harm and whether they are likely to experience the health benefits of alcohol. Since then, the standard drink has been a central feature in some alcohol education campaigns, predominantly in English-speaking countries, and has been used as a practical way of implementing government recommendations and guidelines on drinking. A 'safe' or 'low risk' number of standard drinks is based largely on existing medical evidence on long-term harm associated with different drinking levels and was designed as a tool to aid the public in avoiding potential harm."*<sup>5</sup>

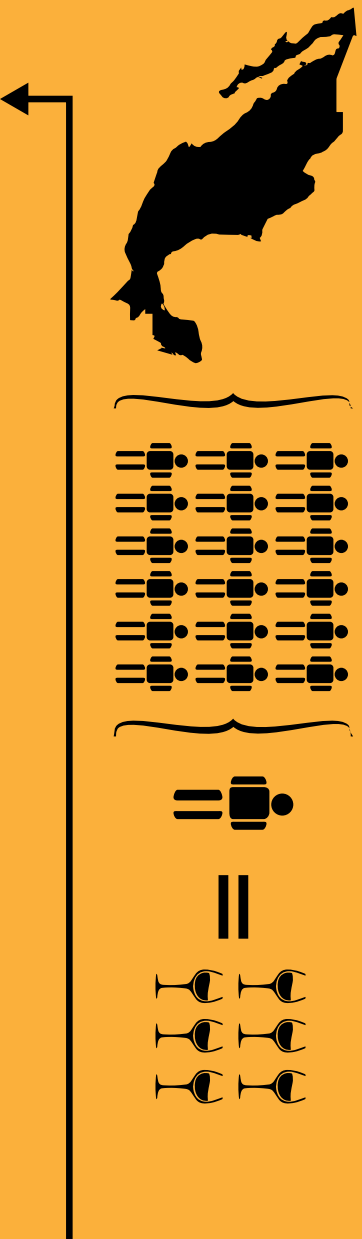
*This is why, since 1998, FISAC has worked with this concept for preventing harmful use of alcohol.*

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5 ICAP 1998

# What is the standard drink used for?

1. To carry out studies



2. To produce guidelines  $\longrightarrow$  3. In the prevention of harmful alcohol use



## BACKGROUND

It is important to conduct a brief historical review that will allow us to put into context the efforts of the different people, civilizations, and human groups to regulate excessive drinking, specifically, what measures, related to the quantity of alcohol consumed, have been taken throughout time.

Responsibility and moderation in consumption of alcoholic drinks are very old topics. We know that fermented drinks were produced deliberately over 5000 years ago in Mesopotamia (Damerow, 2012). Since ancient times, different guidelines have been in place regarding alcoholic drinks, each coming from different perspectives.

The oldest written law on alcohol known is that of Hammurabi's reign over Babylon, around 1750 BC. It regulated beer and wine sales, and established measuring standards (for sale), protection for those who consumed, and responsibilities for salespersons. On the other hand, some paintings and engravings of Ancient Egypt show parents teaching their children the dangers of drinking too much.

Hippocrates, considered the father of modern medicine, thought that the dose of wine drunk was fundamental. He recommended to drink it "with tact and in just measure" leaving aside excessive consumption. In Plato's times, there was a law that regulated the consumption of alcohol since it forbade consumption of wine until after turning 18, suggested that by the age of 30 it be taken with

moderation, and recommended it for old men and women as a medicine for the rigors of the age (SEDESA 2010).

A lot was discussed in Ancient Greece regarding the limit between moderation and intoxication. Great thinkers and writers such as Seneca, Diogenes, Homer, Plato and Pliny the Elder, among many others, pondered upon the matter in some of their texts. Greek mythology is riddled with scenes in which there is alcohol use, and it's presented with very different objectives and consequences.

In a text attributed to Eubulus, it is suggested that three wine glasses were the limit of moderation, after which "wise guests, go home". The same measure is in a text by Panyassis, saying that to drink without moderation is "to exceed a third round". Apuleius also spoke of three glasses as the limit (Amat Flórez, 2006). It is known that some ancient Greeks aspired to *sophrosyne*, i.e., the spirit of moderation, self-control and wisdom.

Around the first century BC, Hero of Alexandria described the "Cup of Tantalus". This cup has a marked limit, so if you exceed it while serving, the cup's entire content spills out from the base through a syphon. The name is taken from the Greek myth of Tantalus who, as punishment for his faults, is condemned by the gods to suffer hunger and thirst for all of eternity. For this, they submerged him up to his chin in water so that when he tried to drink it, the level dropped, remaining just outside his reach. The serving limit of the cup corresponds to Tantalus' mouth, so that if it is exceeded, the drink would automatically pour out, representing



divine punishment (see *infograph 7*).

It is also known as a Pythagorean cup, since its invention is attributed to the great philosopher and mathematician of Samos. It is said that Pythagoras invented it sometime during the fifth century BC in order to warn youths and wine drinkers that if you indulge in excess, you lose everything.

Alcohol drinking in Pre-Columbian times in Mexico was also subject to regulations. Its use was mainly tied to religious rituals, adapted to the worldview of each culture. It is known that the Mexicas (Aztecs) severely punished people that drank in excess as it was very frowned upon (they were shaved, their houses demolished or they were even stoned). However, several exceptions existed: during certain festivities, or while doing certain activities and in old age, people could drink *pulque* (an alcoholic beverage made from the fermented sap of the maguey -agave- plant). In 'Alcoholism in Mexico, III' (1983), we can find Brother Juan of Torquemada's reference in 'Twenty-one Ritual Books and Indian Monarchy' that authorities "gave permission to old people of over 50 to drink wine [pulque], since it is said that blood gets colder at that age and wine is the remedy for warmth and sleep, and they would drink two or three small cups, and did not get drunk with these. To those who had recently given birth, it was also common, in the first days after childbirth, to give them wine to drink, not out of a bad habit, but as a necessity. Plebeian and hard-working people, when they carried wood from the hills or when they brought big stones, would then drink to make an effort and to cheer up... But

many had an aversion to wine so neither sick nor healthy would they try it.” Brother Bernardino of Sahagun wrote that, immediately after rising to power, Mexica emperors exhorted the population to not get drunk. We can also notice that these native groups had several approaches to establishing measures of moderation, although it is impossible to determine the exact quantity of pure alcohol that they ingested since the alcoholic graduation of pulque is very variable, as are the size of the containers and the quantity people drank. Some excavations in the areas of Culhuacán and Tlatelolco have found pulque glasses<sup>6</sup>. It is thought that they were used in diverse religious rituals although we do not know how many cups people were allowed to drink. Knowledge surrounding alcohol drinking in Pre-Colombian Mexico can be found in certain archaeological materials, such as the mural of “The drinkers” (“*Los bebedores*”) found in Cholula. In it, we can see several people drinking cups of pulque around some pulque barrels.

In FISAC’s 12th seminar, published in 2002, Dra. Consuelo García Andrade spoke of the difficulty of measuring alcohol consumption and its associated damages in a Hñähñu population of the Valley of Mezquital, due, among many other things, to the variation in the measures: the population reported to drink “*cups*” or “*pencas de pulque*”, whose measures can be very varied. The aforementioned gives us a panorama of the convenience of establishing recipients and portions that facilitate the approximate measurement of pure alcohol content of what is consumed, so that one may keep in line with health, as well as road traffic or social safety, thus lowering the consequences of its harmful use.

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<sup>6</sup> In the Archaeological Museum of Apaxco of Ocampo, we can find an *Octecómatl* or pulque dish. It is believed that its use was ceremonial, dedicated to the pulque deities.

During the period that followed the arrival of the Spaniards to Mexico, the religious and ideological controls in place around pulque use in indigenous groups began to disappear. Coupled with many other factors, this opened the way to the proliferation of harmful use of alcohol in the indigenous population, which, in turn, led to multiple efforts to reduce its consumption.

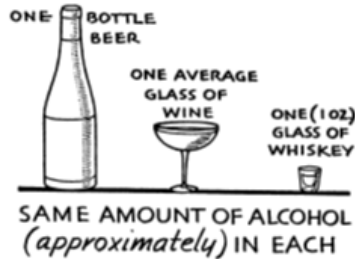
In "*Consumption of alcohol and tobacco in Mexico*" (2012) of the National Commission Against Addictions (CONADIC), it is stated that the first time that an alcohol policy in Mexico considered how much alcohol should be consumed was in 1915, along with the new regulation of alcoholic drinks proposed by the Carranza administration. In it, the possible locations for taverns were specified and the sale of alcohol was forbidden to minors, "women of arguable morals", gendarmes, soldiers, and policemen in service. "This regulation included for the first time the quantity that could be consumed, since it stated that one could not sell more than a quarter of liquor to be consumed by a single person in an establishment." A 'quarter' of liquor, assuming 250ml of a beverage that has 38% Alc. Vol. would be equal to approximately six standard drinks as currently defined. We consider that by not having a definition of a Standard Drink or of what represents a moderate use, this reference can provoke confusion among people.

In the year 1896, Dr. Francis E. Anstie proposed in England a daily level of consumption of alcohol that, based on his research, could be considered healthy. This level was 1.5 ounces of pure alcohol. The book "Drink" by Dr. Vance Thompson, published in 1915, notes

that Anstie's limit could be considered to be equivalent to three ounces of distilled spirits; two glasses of port wine (i.e., fortified wine); a half-litre bottle of claret wine, champagne or another light wine; three full glasses of beer; or 4 to 5 glasses of light beer (page 47). Francis Anstie's recommendation corresponds to nearly 43 ml of pure alcohol a day. It is interesting to notice that he tries to make an equivalence between different drinks, focusing on their content of pure alcohol.

In the book "What about alcohol?" written by Bogen and Lehmann in 1934 (page 86), we find a very similar outline to that used nowadays when speaking of Standard drink:

It is complicated to determine the exact moment the idea of a Standard drink was formalised, but it is already present in the *Lexicon of alcohol and drug term* published by the World Health Organization (WHO) in 1994.

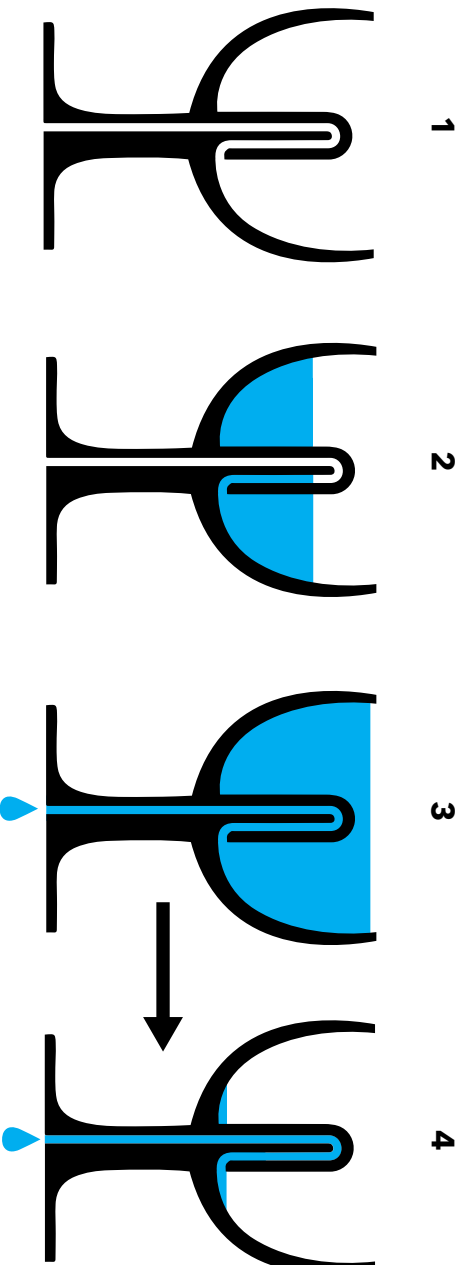


There is a definition for "Unit of standard drink" or "Standard drink." We also have on record that in our seminar number 11 published by FISAC in the year 2001, the president of the National Association of Discos, Bars and Entertainment Centers Industry (ANIDICE), spoke of the use of a Standard Drink since the 1970's. During his presentation entitled "The standard drink in service establishments", he said that this measurement equaled a total volume of 1 ounce (fl. oz., British equivalent unit to 28.41 ml).

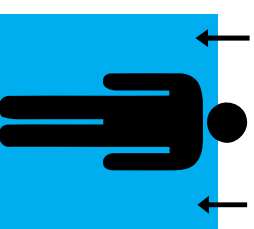
Measuring in ounces allows us to know how many drinks are in every bottle, thus enabling a better control of costs and sales. He also mentions that in the 80's, the Standard Drink increased in Mexico to 1.5 ounces (42.61 ml) due to mores and customs within the population.

These brief examples show us that throughout history there have been different strategies to regulate the consumption of alcoholic drinks to avoid suffering its negative consequences, product of its harmful use. One of those strategies has been to create containers and measurements that allow consumers to easily keep track of how much they drink. Nowadays, we know that in order for this to have the desired impact, it should be accompanied by informative and preventive campaigns.

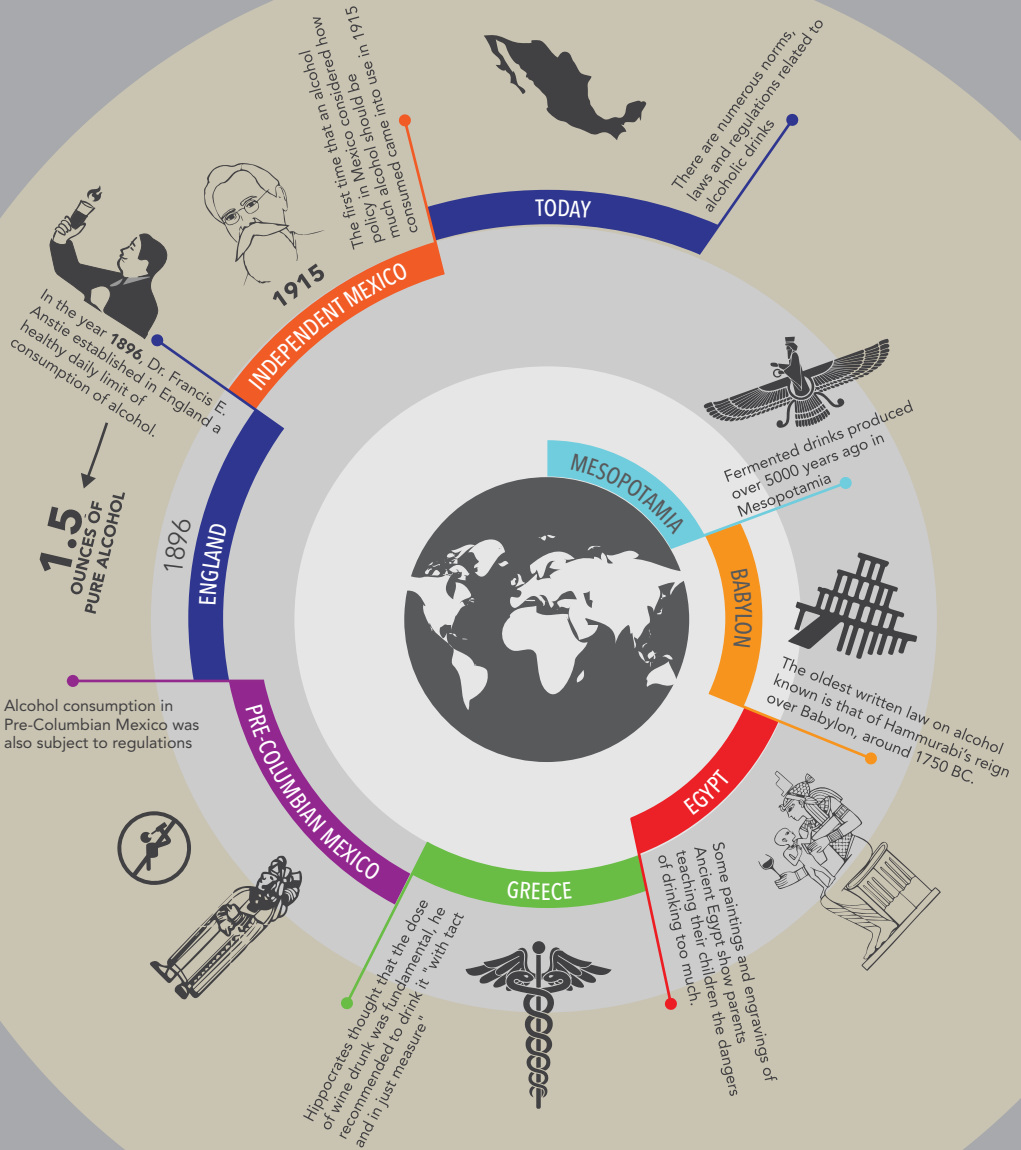
## Cup of Tantalus (Pythagorean cup)



Around the first century BCE, Hero of Alexandria described the “cup of Tantalus”. This cup has a marked limit, so if you exceed it while serving, the cup’s entire content spills out from the base through a syphon. The name is taken from the Greek myth of Tantalus who, as punishment for his faults, is condemned by the gods to suffer hunger and thirst for all of eternity: They submerged him up to his chin in water so that when he tried to drink it, the level dropped, remaining just outside his reach. The serving limit of the cup corresponds to Tantalus’ mouth, so that if it is exceeded, the drink would automatically pour out, representing divine punishment.



# BACKGROUND



## THE STANDARD DRINK AROUND THE WORLD

Let us now delve into a review of what some important international institutions have said regarding the Standard Drink and how they have used it in their texts, tools or programs, in order to broaden our view on the issue.

### WORLD HEALTH ORGANIZATION

In the glossary of *“WHO STEPS Surveillance Manual: The WHO STEP wise approach to chronic disease risk factor surveillance.”* published in 2005, page 478, we find the following definition of “Standard Drink”, “The net alcohol content of a standard drink is generally 10g of ethanol depending on the country/site. This is the equivalent of 1 regular beer (285ml), a single measure of spirits (30 ml), a medium-sized glass of wine (120 ml), or a measure of aperitif (60 ml)” (*Originally quoted from the Spanish version, published a year later, in 2006, page 455*).\*

In WHO’s *“Brief Intervention for Hazardous and Harmful Drinking”* (2001), Appendix A, page 37, we find a panel that outlines what constitutes a Standard Drink for them. This same information is in Infograph 9 at the end of this section.

Let’s not forget that the value of a Standard Drink varies from country to country, which is why it is common to find different

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\* This is included to offer a reference point and by no means is to be considered an international definition.



values, mainly when the measures have not been standardised.

In the “Lexicon of alcohol and drug terms” published by the WHO in Spanish, in 1994, we find a definition of a “Standard Unit of Drink”: “A volume of beverage alcohol (e.g., a glass of wine, a can of beer, or a mixed drink containing distilled spirits) that contains approximately the same amount (in grams) of ethanol regardless of the type of beverage. The term is often used to educate alcohol users about the similar effects associated with consuming different alcoholic beverages served in standard-sized glasses or containers (e.g., the effects of one glass of beer are equal to those of one glass of wine). In the UK, the term “unit” is employed, where one unit of an alcoholic beverage contains approximately 8-9 grams of ethanol; in North American literature, “a drink” contains about 12 grams of ethanol. In other countries, the amounts of alcohol chosen to approximate a standard drink may be greater or less, depending on local customs and beverage packaging.”

In the Appendix C of the “Alcohol Use Disorder Identification Test” (AUDIT) published in 2001, we find that a Standard drink is used by health educators and researchers with many values due to the differences in typical measures for drinks in each country. They show a small chart indicating the value of the Standard Drink in several countries, which is also depicted in infograph 9, along with other information previously mentioned.

As we can see, the value of the Standard Drink or SDU is variable. This happens partly because the documents that speak of Standard Drink are translations of studies carried out in other countries.

**INTERNATIONAL ALLIANCE FOR RESPONSIBLE DRINKING (IARD), formerly ICAP<sup>7</sup>**

In the “ICAP Blue Book: Practical Guides for Alcohol Policy and Targeted Interventions” in its Module 20, “Standard drinks”, we can find the following points:

- Standard size definitions of a “drink” or “unit” (expressed in grams of pure ethanol) are useful tools for both public health and commercial purposes.
- Governments and public health bodies in a number of countries have issued definitions of standard “drinks” or “units”.
- The concept of a standard measurement is useful for informing individuals about how much alcohol they are consuming.
- Definitions of standard alcohol units are often provided in conjunction with drinking guidelines.
- There is no consensus internationally on a single standard drink size, and a range of measurements is used by official entities and by researchers.

In IARD’s website there is an International Drinking Guideline Table in which we can appreciate different definitions of a Standard

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7 International Center for Alcohol Policies

drink, specified by country (refer to Infograph 9).

We can notice that several countries have been able to establish a value for the Standard Drink, this allows them to set limits and measurements.

### **PAN AMERICAN HEALTH ORGANIZATION (PAHO)**

Even though PAHO does not give an official definition of 'Standard Drink', in the Spanish version of the document "Alcohol and Primary Health Care. Clinical Guidelines on Identification and Brief Interventions", published in 2008, we find the following:

"Alcohol consumption can be described in terms of grams of alcohol consumed or in terms of standard drinks, where, in Europe, a standard drink commonly contains 10g of alcohol. Although not all countries of the region have a definition of a standard drink, in United States and Canada, a standard drink contains between 12 and 14 grams of alcohol.

Hazardous alcohol consumption is a level of consumption or pattern of drinking that is likely to result in harm should present drinking habits persist, a working definition of the World Health Organization describes it as a regular average consumption of 20g-40g of alcohol a day for women and 40g-60g a day for men."

Quoted directly from the English version, on page 18 it says, "The World Health Organization (Babor & Higgins-Biddle 2001) proposed

that a standard drink is the equivalent of:

- 330 ml of beer at 5% strength
- 140 ml of wine at 12% strength
- 90 ml of fortified wine (e.g. sherry) at 18% strength
- 70 ml of a liqueur or aperitif at 25% strength
- 40 ml of spirits at 40% strength

Due to its specific gravity, one ml of alcohol contains 0.785g of alcohol, so the WHO definition of a standard drink is about 13g of alcohol. In Europe, standard drinks commonly contain about 10g of alcohol (Turner 1990)."

### **NATIONAL INSTITUTE FOR ALCOHOL ABUSE AND ALCOHOLISM (NIAAA)**

In the leaflet *"Tips For Cutting Down On Drinking"* the US NIAAA mentions that, "In the United States, a standard drink is any drink that contains about 14 grams of pure alcohol (about 0.6 fluid ounces or 1.2 tablespoons)." They then proceed to show a chart with some standard equivalences of different drink types (refer to Infograph 9).

They also, enlist a series of recommendations to help reduce or eliminate alcohol use completely, as considered convenient:

- Keep track of how much you drink.
- Counting and measuring: Know the standard drink sizes so you can count your drinks accurately
- Setting goals: Decide how many days a week you want to drink

and how many drinks you'll have on those days.

- Pacing and spacing: Have no more than one drink with alcohol per hour.
- Including food both before and while you're drinking
- Avoid "triggers": Avoid situations or people that trigger the urge to drink excessively.
- Plan to handle urges: Talk it through with someone you trust, remind yourself of your reasons for changing, "urge surf"—instead of fighting the feeling, accept it and ride it out, knowing that it will soon crest like a wave and pass.
- Knowing your "no": Have a polite, convincing "no, thanks" ready.

As we can notice, the Standard Drink is applied in these recommendations. Its use allows us to know what a drink is, how many drinks one can have and in how long, and how to serve a drink.

In the document "Rethinking drinking. Alcohol and your health" published in 2010 (Spanish version in 2012), the 14 gram value for the Standard Drink is utilised alongside a chart with equivalences among drinks as well as some brief questions to help monitor our drinking pattern. Afterwards, there is a segment which addresses what constitutes a "low risk alcohol use", understanding that this is no more than 4 drinks for men and 3 drinks for women on any given day, and no more than 14 drinks for men and 7 drinks for women, on any given week. They also clarify the following, "low risk" does not mean "risk free". Even within these limits, drinkers might have problem if they drink too fast, if they have health issues or if they are older (it is advised that people over 65, regardless of sex, not exceed 3 drink on any given day, nor 7 drinks in a

week). Depending on their health and how alcohol affects them, it's possible they should drink less, or nothing at all.

**AUSTRALASIAN PROFESSIONAL SOCIETY ON ALCOHOL AND OTHER DRUGS (APSAD)**

In the study "Lack of consensus in low-risk drinking guidelines" published in issue 32 of the Journal, "Drug and Alcohol Review" by Furtwængler and De Visser (2012), a review of official Standard Drink definitions was carried out, as well as a review of guidelines of daily and weekly use in men and women in 56 different countries, that was then reported in grams. It's important to mention that at the time of this study, Mexico didn't have a definition of a standard drink established in any Mexican National Norm (NOM) and therefore it is not included in the corresponding Standard Drink chart (refer to Infograph 9 for a partial chart).

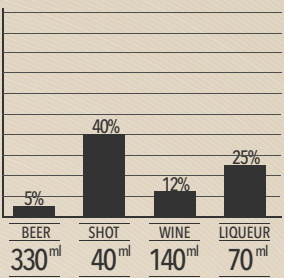
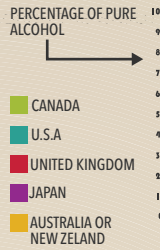
The chart shows us that the investigators found guidelines or definitions of what constitutes a moderate and low risk use in healthy adults.

Ever since the 90's, strategies were implemented in countries such as Australia and England in order to make the Standard Drink a measure that helps consumers know the exact amount of alcohol they are drinking and as of how many drinks, is it considered to be risky use. In her paper, "Relationship between

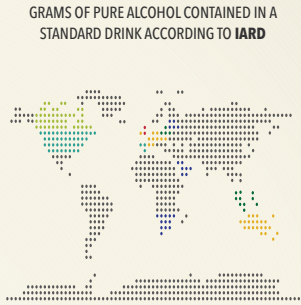
drinks and risks: Evidence and recommendations”, presented as part of FISAC’s 11th Seminar, Haydeé Rosovsky, PhD, mentioned that these strategies have proven to be practical and of great use for people that decide to consume alcoholic drinks.

# WHO

"Standard Drink", "The net alcohol content of a standard drink is generally 10g of ethanol depending on the country/site..."



# IARD

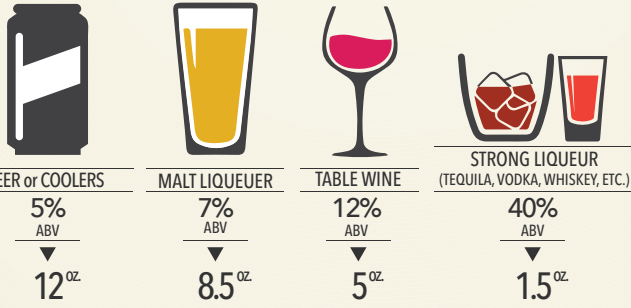


# PAHO

"Alcohol consumption can be described in terms of grams of alcohol consumed or in terms of alcohol content of different drinks, in the form of standard drinks."



# NIAAA



Recommendations to help reduce or eliminate alcohol use completely:

- Keep track of how much you drink.
- Measuring in standard drinks
- Setting goals: How much one will drink
- Pacing and spacing
- Including food both before and while you're drinking
- Avoid "triggers"
- Plan to handle urges
- Knowing your "no"

# APSA



COUNTRY	S.D.	DAILY INTAKE			WEEKLY INTAKE			WEEK: Daily proportion	
		♂	♀	♀	♂	♀	♀	♂	♀
MEXICO	-	48	36	1.33	144	108	1.33	3.00	3.00
BRASIL	10	30	20	1.50	-	-	-	-	-
USA	14	56	42	1.33	196	98	2.00	3.50	2.33
CANADA	13.45	40.35	26.9	1.50	201.75	134.5	1.50	5.00	5.00

The chart shows us that researchers found guidelines or definitions of what constitutes a moderate or low risk alcohol use in grams of ethanol in healthy adults.



## **THE STANDARD DRINK IN MEXICO**

Many national government bodies have used some sort of variation on the Standard Drink in their education and health promoting programmes. What follows is some of them:

### **NATIONAL COMMISSION AGAINST ADDICTIONS (CONADIC)**

In their document “Tú decides” (“You decide”; 2008) CONADIC mentions that, when speaking of the Standard Drink, they refer “to the different presentations of drinks that contain approximately the same amount of alcohol (12 g)”, they then present a chart with information we’re reproducing at the end of this section, in Infograph 10.

Also, in the section “2.3.5. Decrease of problems associated with harmful drinking” (p. 32) of the “Programme against alcoholism and abuse of alcoholic drinks: 2011-2012 Update” they propose to “develop guidelines on the content of pure alcohol and equivalencies in standard drinks and on how much of the labelling (proportion) should be dedicated to said information of the content of the drink.”

### **YOUTH INTEGRATION CENTRES (CIJ)**

In the book, “Youths and alcohol in Mexico” (2010) we can find a chart, based on the document by Babor and Higgins-Biddle (2001), of standard alcoholic drink equivalencies. The authors mention that when speaking both of fermented and distilled drinks, “there is no difference in the alcohol present in these different drinks,

the only difference lies in the concentration of said alcohol". This factor is compensated with the volume of liquid that is commonly served for its consumption (refer to Infograph 10).

**INSTITUTE FOR THE ATTENTION AND PREVENTION OF ADDICTIONS (IAPA) in Mexico City**

Through informative and preventive material they transmit the concept of a Standard Drink; they draw awareness to the danger of drinking in excess and they share some suggestions to reduce and control one's use. This material is available on their webpage<sup>8</sup>. We reproduce a small part of it in Infograph 10.

The Standard Drink, according to this information, is around 14g of Ethylic Alcohol (EtOH).

**SOCIAL INVESTIGATIONS FOUNDATION (FISAC)**

As previously stated, FISAC has worked with the concept of a Standard Drink since 1998 in its programmes dedicated to the prevention of a harmful use of alcohol, giving it an approximate value of 12g of ethanol. In order to spread its use, we carry out multiple actions. For example, through the publication of books, guides and manuals, through giving workshops and both face-to-face and online trainings, through the systematic use of electronic means such as the Foundation's official webpage, [www.alcoholinformate.org.mx](http://www.alcoholinformate.org.mx), and through social media, among others. In its printed and digital materials, diagrams, such as the one used in Infograph 10, are used.

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<sup>8</sup> Available at: <http://www.iapa.df.gob.mx/work/sites/iapad/resources/PDFContent/1589/separador.pdf>, recovered the day November 20 of 2014

## MEXICAN FEDERAL GOVERNMENT

In the Official Mexican Norm, **NOM-142-SSA1/SCFI-2014, Alcoholic Drinks. Sanitary Specifications**. Sanitary and Commercial Labelling., numeral 9.4.1.2.1., it says that, when referring to “a standard portion of a drink” they are speaking of an amount of alcohol corresponding to 13 grams, considering its specific gravity (density) is of 0.785g/ml. This value for a standard drink became rooted after the law reform of 2014 (refer to Infograph 11). Also, in Appendix D, Informative of **NOM-047-SSA2-2015, For Healthcare of the Age Group 10 to 19 years of age.**, it says, “in Mexico, a standard drink unit has approximately **13 grams** of ethanol or ethylic alcohol”.

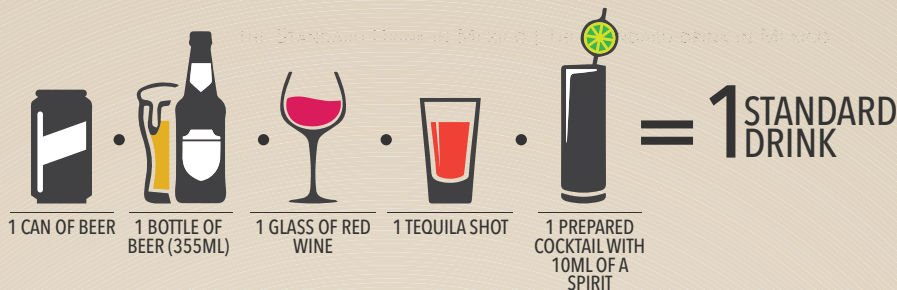
After having walked through this brief summary of different concepts for the Standard Drink, we consider it imperative to unify criteria in order to implement strategies of great reach within a population. It is of utter importance that the information used in preventing a harmful use of alcohol be consistent and congruent so that it may not be misconstrued, thus losing its possibility of generating a positive impact, and consequently its ability to contribute to a cultural change in alcohol use in Mexico.

Finally, as a summary, we present a graph (refer to Infograph 11) where we can observe multiple official definitions of what constitutes a Standard drink in 23 countries (IARD, 2017). We have included Mexico with a value of 13 grams according to what is specified in **NOM-142-SSA1/SCFI-2014 and in NOM-047-SSA2-2015**. Due to the wide range in variation, it would be impossible to try to

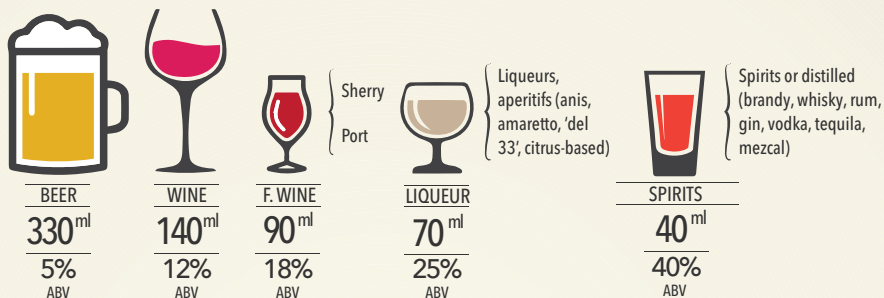
establish what constitutes a low-risk use of alcohol internationally; For example, 3 standard drinks in Japan are equal to 5.9 drinks in Spain. Due to this, we can frequently find that recommendations of what is a moderate use, be expressed in terms of grams of pure ethanol. Having a national definition of Standard Drink, would help consumers have control over the amount of pure alcohol they consume, regardless of the different drinks that are offered in the market.

*The Standard Drink in and of itself, is a useful tool, but it should be accompanied by more health information in order to be comprehensible and acceptable to the population. Some people might consider that the amount of alcohol contained in a standard drink is very poor or that consumption recommendations are very low. In order for the information to be complete, it's also important to inform about metabolising times, absorption times and effects related to the elevation of the Blood Alcohol Content (BAC). Otherwise, the information seems arbitrary, merely with restrictive purposes. The important thing is to align all available information so that recommendations are not perceived as threats to personal freedom. It's all a question of health and risk prevention. The harmful use of alcohol comes with a wide range of negative consequences, all of which the population must be warned of, in order to generate reflection and raise awareness.*

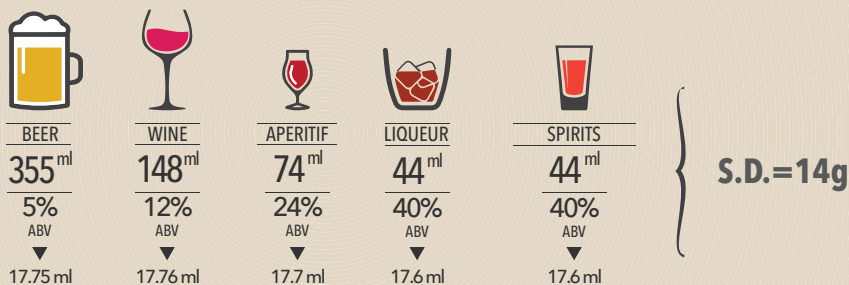
# CONADIC



# CIJ



# IAPA



## TO REDUCE ALCOHOL USE:

- Know the measure of a standard drink, to count your drinks
- Keep track of how much you drink
- When drinking, do it slowly by taking small sips
- Don't drink on an empty stomach
- Take control of your urges
- Learn to say "No, thank you"



2 GLASSES A DAY

4 GLASSES ON EXCEPTION  
(Parties, Celebrations)

12 PER WEEK

← NO MORE THAN →

1 GLASS A DAY

3 GLASSES ON EXCEPTION  
(Parties, Celebrations)

9 PER WEEK

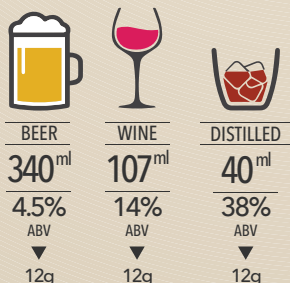


⚠ NOT ALL ON THE SAME DAY

🕒 ONE PER HOUR ACCOMPANIED BY FOOD

# FISAC

S.D. = 12g



Books

Guides and manuals



Capacity building workshops and trainings



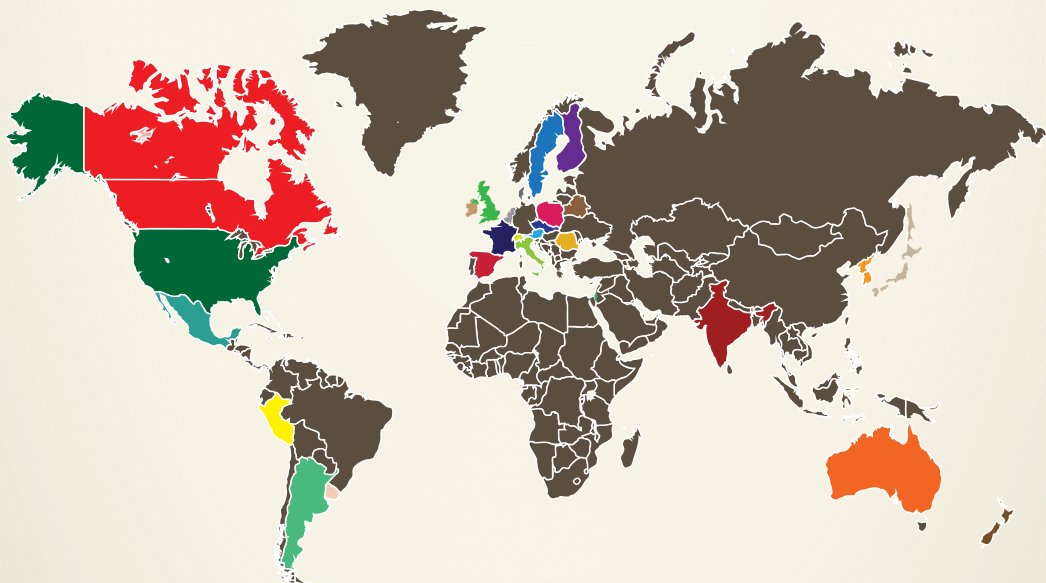
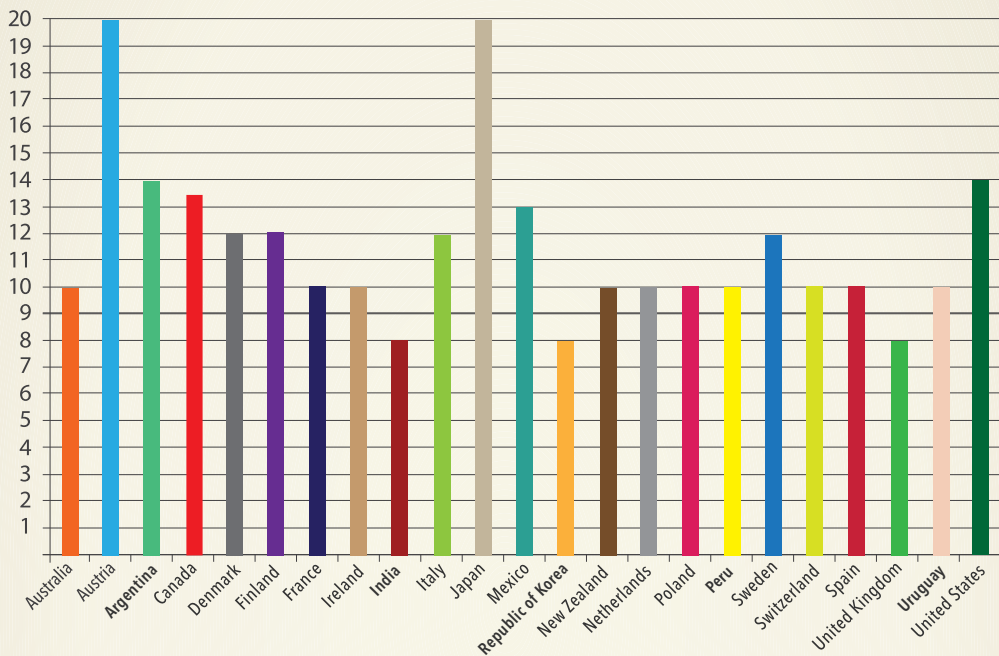
Face-to-face and online electronic media



**NOTA:** In 2015, FISAC adheres itself with the NOM 142 and adopts the standard drink value of 13 g

# OFFICIAL DEFINITIONS

We can observe multiple official definitions of what constitutes a Standard drink in 23 countries (IARD, 2017). Standard Drink in Mexico as specified in NOM-142-SSA1/SCFI-2014 and in NOM-047-SSA2-2015.



## HOW IS THE VALUE OF THE STANDARD DRINK DETERMINED?

In order to determine the amount of pure alcohol contained in a Standard drink, it is necessary to revise which drinks are consumed the most in the country and how they are regularly served. In the WHO's Global Status Report on Alcohol and Health, 2014 it is pointed out that 76% of all alcohol consumed in Mexico is beer, 22% corresponds to distilled spirits, 1%, wine and the remaining 1% to all other alcoholic beverages. We can then notice that most of the population drinks beer that is commonly sold in 355 ml cans or bottles, with approximately 4.5% ABV, which is equal to 12.54 grams of pure alcohol per drink. In the case of tequila, it's usually served in shot glasses (*tequileros*) of approximately 43ml, considering an average 38% ABV, this equals 12.82 grams of pure alcohol per drink (refer to *Formulas and Applications*). In light of this, it's necessary to consider the quantities in which drinks are regularly served, according to their ABV percentage in order to obtain an average of pure alcohol per drink.

Something that is indispensable to take into account is that, to be in line with the recommendations made by public health authorities, the Standard Drink should be expressed in units that are easy to quantify, not only for its consumption, but also to consider its processing and elimination from the body (refer to *Pharmacokinetics*). We know that 13 grams of ethanol are metabolised in a healthy adult man's body in approximately one hour, and in an hour and a half in healthy adult women (refer to *Pharmacokinetics of ethanol*). Adjusting this kind of information

could prove useful when clarifying the processes and the time they imply.

As previously mentioned, the Standard Drink varies from country to country. In the USA, the Standard Drink has a value of 14 grams of alcohol, while in Japan it amounts to 19.75 grams. Even when the value *per se* varies, the Standard Drink can be used in creating guidelines and recommendations. As long as drinks can be correlated to the time it takes to metabolise ethanol in the organism, it will be easier to keep track and be conscious of exactly how much one is drinking.



## **HOW DO WE SERVE OR HAVE A DRINK IN MEXICO?**

When we ask people this, different opinions immediately arise. Some people think that counting quickly up to 10 will give us "a drink", others can assure that you can get an accurate measurement with your fingers, or that the limit is reached when the liquid covers the ice, still others will say that you keep pouring for as long as it takes to say your name. Some think that the classic "red cup", so commonplace at parties, have lines indicating standard measurements for each kind of beverage, be it beer, wine, fortified wine, liqueur or distilled spirit. There exist a large number of practices and beliefs regarding how to serve a drink, but none is precise and this hinders the ability of quantifying exactly how much alcohol is being consumed. Furthermore, some cocktails use more than one standard drink's worth of alcohol to prepare them, some can have up to, or even more than three.

As can be appreciated in Devos-Comby and Lange's research (2008), people don't usually prepare their drinks according to the standard drink measurement that corresponds to their country; in some cases, that is because they don't know or aren't familiar with the concept, and in others because they underestimate or simply don't take into account the concentration of alcohol their drink has at the time of serving. The fact that there are many sizes of glasses, mugs and the like can also confuse people when serving a drink, because it has been reported that in larger glasses, people serve a larger quantity. In many studies that have been carried out, it was observed that great variation exists between self-defined sizes and

national standard sizes<sup>9</sup>, which has implications for meeting health guidelines and in research. It is therefore necessary to promote understanding among the population, both of the concept of a Standard Drink itself and also of how to apply it as a tool to better survey personal alcohol use (regarding total volume and alcohol contents of drinks).

We know that jiggers and other measuring cups have varied marks that express ounces (e.g., 1 fl. oz and 1 ½ fl. oz) and that they were designed to make the appropriate measurements to obtain standard drinks. However, they are not commonplace in households (even when they are easy to get in stores that sell home utensils), and even when they are purchased, they are not commonly used. On that same note, they can be found in bars and nightclubs, but some barmen will appeal to their experience when calculating the amount of alcohol to pour in each drink. It's interesting to learn that Chefs and professional Barmen study this concept to be able to correctly serve drinks. Introducing the Standard Drink in drinking culture, using this type of objects to reinforce the information, would be a good beginning to consolidating solid concepts regarding responsibility and moderation in alcohol use.

Another relevant topic in our country is the persisting idea that low-alcohol content beverages, such as coolers, beers and cocktails, inebriate less, and therefore may be considered as "moderation beverages" (*bebidas de moderación*). The Standard Drink will tend to clarify the fact that it doesn't matter what one is drinking. As long as it is served properly, every alcoholic drink will contain

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<sup>9</sup> Devos-Comby and Lange (2008) postulate that an important bias in numbers can exist within alcohol use research papers if it is assumed that people understand and know how to use the concept of the Standard Drink to serve their drinks.

the same amount of pure alcohol. Due to its prevailing drinking pattern, Mexico has a considerable risk level (according to the WHO's Global Status Report -2014-, on a scale of 1 to 5, Mexico is at a 3). As previously mentioned, true responsibility and moderation falls on consumers, i.e., on society as such.

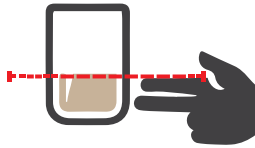
# HOW DO WE SERVE OR HAVE A DRINK IN MEXICO?



POPULAR BELIEFS



Quickly count to 10



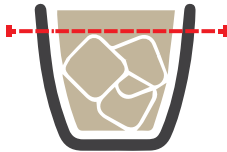
Measuring with one's fingers



Directly from the bottle



Marked party cups



"Just enough to cover the ice"



As long as it takes to say one's name

2 fl. oz.



1½ fl. oz.

1 fl. oz.



½ fl. oz.

## FOR A RESPONSIBLE MEASUREMENT:

We know that jiggers and other measuring cups have varied marks expressed in fl. Oz. They were designed to make the appropriate measurements to obtain standard drinks; However, they are not commonplace in households (even when they are easily found in stores that sell home utensils).

## FORMULAS AND APPLICATIONS

### WHAT DO WE NEED TO KNOW TO CALCULATE A STANDARD DRINK?

In order to be able to carry out the operations that allow us to convert different measurements, to calculate the ethanol content of a Standard Drink, to know the correct amount of liquid needed to serve, as well as other applications, it is fundamental to be familiar with, and to know how to use a series of formulas and operations.

We have reviewed that the ethanol content of a Standard Drink is usually reported in grams. This can generate certain confusion since we usually measure liquids in liters or milliliters, while grams or kilograms are reserved for solids. In other words we are accustomed to use different measuring units, according to the state of the matter (liquid or solid). **Density ( $\rho$ ) or specific gravity** will help us to understand how and why this is done, since it is the relationship that exists between the mass and the volume of a body or substance. This makes it important to know ethanol's specific gravity in order to accurately convert grams to milliliters.

In existent written works, we will find slight variations for ethanol's density depending on its temperature (e.g., 0.7939 or 0.8). In this document, we will use the value specified in the Official Mexican Norm **NOM-142-SSA1/SCFI-2014**, that corresponds to **0.785g/ml** at a 25°C temperature. For example, ethanol's  $\rho$  is different to that of water (which would be our immediate reference); while 1

milliliter of water weighs 1 gram (since water’s density is 1g/ml), 1ml of ethanol weighs approximately 0.785 grams, therefore it would be wrong to assume that the 13 grams of ethanol contained in a Standard drink, correspond to 13 milliliters. Additionally, these conversions are necessary in public health because it’s extremely useful and practical to know the amount of pure ethanol that is consumed, regardless of the type of drink (fermented or distilled), since both are made up of the same substance: ethanol. Considering the variation that exists from one country to another regarding what a Standard Drink is, it becomes necessary to report ethanol consumption “in an internationally standardised manner” (WHO 2000); this way, making international comparisons easier.

What follows is the formula for calculating density which can be defined as: density ( $\rho$ ) equals mass ( $m$ ) over volume ( $v$ ).

$$\rho = \frac{m}{v}$$

Once we have calculated ethanol’s density (0.785g/ml) and the value of a Standard Drink (13g), we then require to break the formula down to determine the equivalent -in volume- of those 13 grams. The following operation helps us convert grams or units of mass into volume of liquid ethanol, as is illustrated in the example:

$$V = \frac{m}{\rho} \rightarrow \frac{13 \text{ g (mass)}}{0.785 \text{ g/ml (density)}} = 16.560 \text{ ml (volume)}$$

**The previous formula shows us that 13 grams of ethanol are equal to 16.560 milliliters.**

Now, so that we can convert units of volume (e.g., milliliters) into units of mass (e.g., grams), we break the formula down as follows:

$$m=(\rho)(v) \rightarrow (0.785\text{g/ml [ density ]})(16.560\text{ml [volume]}) = 12.999 \text{ g (mass)}$$

This way, while applying the same example, we can confirm that 16.560 milliliters of ethanol are equal to 12.999 grams.

With the previous explanation and examples, we now have elements to carry out the conversions that will allow us to measure or carry out research. In the same way, we can check ethanol's density by substituting the values of the formula:

$$\rho = \frac{m}{v} \rightarrow \frac{13 \text{ g (mass)}}{16.560 \text{ ml (volume)}} = 0.785\text{g/ml (EtOH density)}$$

Now that we know the equivalence in milliliters of 13 g of ethanol, we would have to carry out rules of three to know how much of a drink you must serve so that it is equal to a Standard Drink and/or to know how many grams of ethanol there are in a drink. For this, it is necessary to use the previous formulas and the information pointed out in the examples of the labels (refer to *Identify the Information in your Container*).

To directly obtain the number of grams of ethanol contained in a drink, we can carry out the following operation concentrating the information already seen:

$$\frac{\text{Milliliters of drink} \times \% \text{ ABV} \times \text{Density}}{100} = \text{Grams of Ethanol}$$

As we can notice, these are the same elements previously reviewed.

Let us now substitute the values, using a 750 ml bottle of tequila with a 38% ABV as an example.

We multiply the total amount of milliliters contained in the bottle (750) by the alcohol percentage indicated on the label (38) and, in turn, multiply that by ethanol's density (0.785). The result is then divided between 100 (it's total content), Thusly, the conversion of the product in grams of ethanol is:

$$\frac{750 \times 38 \times 0.785}{100} = 223.725\text{g}$$

If we wanted to transform the result into milliliters of ethanol we would apply the formula previously reviewed: Taking the grams of ethanol, we divide them between the density, obtaining the following:

$$\frac{223.725}{0.785} = 285 \text{ ml}$$

The previous example shows us that 223.72g or 285ml of the total content of our bottle is made up of pure ethanol, but how do I know exactly how much liquid I should pour to obtain a Standard Drink of approximately 13g or 16.560ml of ethanol? To this end we can use a rule of three:

$$V = \frac{16.560 \times 100}{38}$$

Where 16.560 is the number of milliliters of ethanol that we want to obtain (since it equals 13g), so we multiply it by 100, which represents the total volume, and divide this by 38, which is the percentage of ABV in our tequila.

$$\frac{1656}{38} = 43.578 \text{ ml}$$



The result of this operation is how many milliliters of Tequila we should pour to serve a Standard Drink with a content of pure alcohol of 16.560ml. A typical tequila shot glass is usually an ounce and a half (approximately 43ml), which roughly translates into 16.34ml or 12.82g of pure ethanol. Let's keep in mind these values are approximate.

If we wanted to obtain the standard drink measure (16.560ml or 13g of pure ethanol) of a beer with a 4.5% ABV, applying the same formula, we would know to serve 368 ml. Beers in Mexico usually come in 355ml containers, which is similar enough to a standard drink, but not exact. (15.97 or 12.54 g or pure ethanol).

To know how many standard drinks there are in our tequila bottle or in any other drink, we would have to know the quantity of pure alcohol that it contains. As we have already explained, in Mexico drinks are marked with "% Alc. Vol." (ABV), according to the percentage of pure alcohol that they contain. To know this percentage expressed in milliliters we have to solve a rule of three, in the same way we would solve it to know the final price of something in discount we're interested in buying:

$$\frac{750\text{ml} \times 38\%}{100} = 285\text{ml EtOH}$$

Once we've obtained the result (e.g., 285ml EtOH) we divide it by 16.560ml, how many millilitres a Standard Drink contains:

$$\frac{285\text{ml EtOH}}{16.560\text{ml EtOH}} = \mathbf{17.210 \text{ standard drinks}}$$

We can repeat this procedure to know the number of standard drinks contained in any alcoholic drink whatsoever, by using the information printed on its label; for example, let's apply the formula to the 1.2 litre presentation of some 5% ABV beers:

$$\frac{(1200\text{ml})(5\%)}{100} = \frac{60\text{ml EtOH}}{16.560} = 3.623 \text{ standard drinks}$$

Thanks to this procedure, it is possible to accurately know just how many standard drinks of 16.560ml or 13g there are in any alcoholic drink; no matter if its alcoholic content is high or low. We're able to convert measuring units and in doing so, make information regarding alcoholic drinks more comprehensible and accessible to people in general. This, in turn opens the possibility up of planning more solid strategies and design programs capable of preventing harmful drinking, regardless of the product.

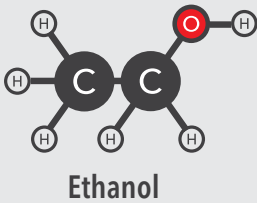
In Infograph 16, an image is shown that depicts the glasses, mugs and other containers most used in Mexico for drinking alcoholic beverages. Through the use of a Standard Drink we will know with certainty the amount that must be served, depending on the specific beverage, so that its alcohol content is of approximately 13 grams (refer to *Formulas and Applications*), regardless of its alcohol content nor the container in which we serve it.

# FORMULAS AND APPLICATIONS

## WHAT DO WE NEED TO KNOW TO CALCULATE A STANDARD DRINK?

$\rho$  = Density ( $\rho$ ) or specific gravity

It is the relationship that exists between the mass and the volume of a body or substance. This makes it important to know ethanol's specific gravity, in order to accurately know how many millilitres equal whatever number of grams.



$$\rho = 0.785\text{g/ml}$$

$$\rho = m/v$$

Density ( $\rho$ ) equals mass ( $m$ ) over volume ( $v$ ).

To know volume, one must break down the formula as follows:

$$\rho = m/v$$

Volume equals mass over density:

$$v = m/\rho$$

To know mass, one must break down the formula as follows:

$$\rho = m/v$$

Mass equals density times volume

$$m = (\rho)(v)$$

STANDARD DRINK

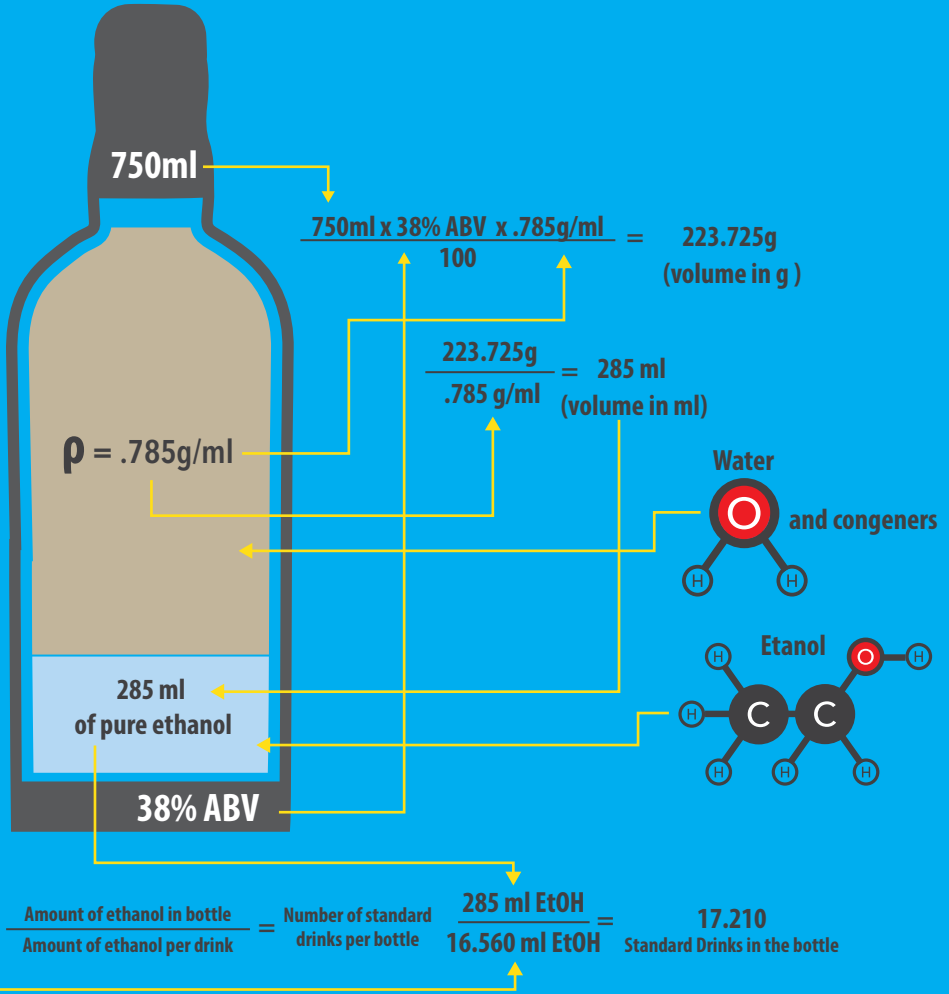


$$v = 13\text{g}/0.785\text{ g/ml} = 16.560\text{ ml (volume)}$$

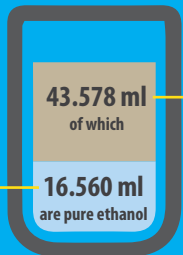
$$m = (0.785\text{g/ml})(16.560\text{ ml}) = 12.999\text{ g (mass)}$$

To directly obtain the number of grams of ethanol contained in a drink, we can carry out the following operation using the information already seen:

$$\frac{\text{Milliliters of drink} \times \% \text{ ABV} \times \text{Density}}{100} = \text{Grams of Ethanol}$$



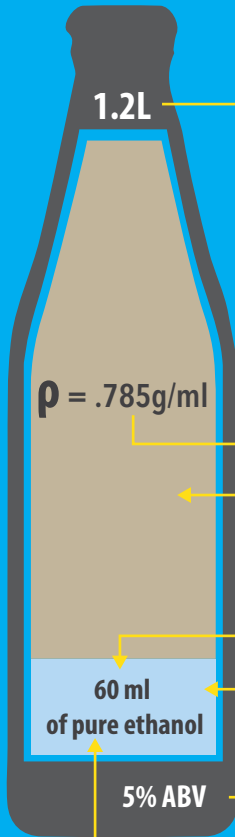
How can we accurately know how many standard drinks of 16.56ml or 13g there are in any alcoholic drink?  
We must solve a 'rule of three':



$$V = \frac{16.560 \text{ ml} \times 100\%}{38\% \text{ ABV}} \rightarrow \frac{1656}{38\% \text{ ABV}} = 43.578 \text{ ml}$$

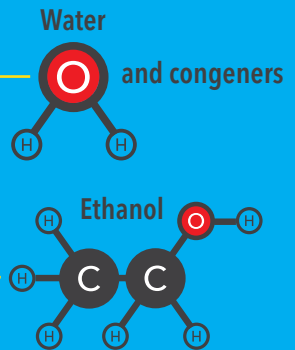
To directly obtain the amount of grams of ethanol in a 1.2 L beer bottle

$$\frac{\text{Millilitres of drink} \times \% \text{ ABV} \times \text{Density}}{100} = \text{Grams of Ethanol}$$



$$\frac{1200 \text{ ml} \times 5\% \text{ ABV} \times .785 \text{ g/ml}}{100} = 47.1\text{g} \text{ (volume in g)}$$

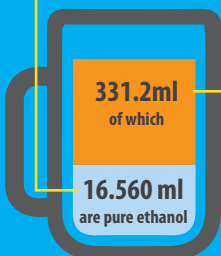
$$\frac{47.1\text{g}}{.785 \text{ g/ml}} = 60 \text{ ml (volume in ml)}$$



$$\frac{\text{Amount of ethanol in bottle}}{\text{Amount of ethanol per drink}} = \frac{\text{Number of standard drinks per bottle}}{\text{Standard Drinks in the bottle}}$$

$$\frac{60 \text{ ml}}{16.560 \text{ ml}} = 3.623$$

How can we know how much liquid to serve to make sure we have a standard drink of approximately 13g or 16.56ml of ethanol?  
Again we use a 'rule of three', and substitute known values:



$$V = \frac{16.560 \text{ ml} \times 100\%}{5\% \text{ alc. vol}} \rightarrow \frac{1656}{5\% \text{ alc. vol}} = 331.2 \text{ ml}$$

## How to serve a Standard Drink.

Through the use of the standard drink, we'll know with certainty the amount to be served of any given drink so that its alcohol content is approximately 13 grams (see Formulas and Applications), regardless of its ABV or the container in which it's poured.



NAME									
HIGHBALL GLASS	TEQUILA GLASS (SHOT GLASS)	WINE GLASS	APERITIF OR LIQUEUR GLASS	COCKTAIL GLASS	OLD FASHION GLASS	COCKTAIL GLASS II	SHORT GLASS	BEER MUG	
36.8ml	43.57ml	138ml	82.8ml	47.31ml	33.12ml	41.4ml	97.41ml	394.28ml	
45% ABV	38% ABV	12% ABV	20% ABV	35% ABV	50% ABV	40% ABV	17% ABV	4.2% ABV	

**OF DRINKS WITH:**

## PER CAPITA CONSUMPTION AND THE STANDARD DRINK

In the *Global Status Report on Alcohol and Health 2014* published by the World Health Organization (WHO) we can find information regarding *per capita* consumption in Mexico. This is the average amount of pure ethanol that is consumed by anyone over the age of 15, through-out one year. One needs to add all the imported alcohol and subtract all that was exported from all nationally produced alcohol. Although both are included, a difference is made between formal (registered) and informal (unregistered) alcohol, where the former complies with all the current laws, while the latter is marketed without completing the official regulatory framework of any given country.

Alcohol per capita (+15) consumption (in litres of pure alcohol)			Total alcohol per capita (+15) consumption, drinkers only (in litres of pure alcohol), 2010	
Recorded	Average 2003-2005	Average 2008-2010	Males (+15)	18.0
	<b>5.1</b>	<b>5.5</b>		
Unrecorded	<b>3.4</b>	<b>1.8</b>	Females (+15)	5.7
<b>Total</b>	<b>8.5</b>	<b>7.2</b>		
<b>Total males/females</b>	<b>12.4</b>	<b>2.6</b>	Both sexes (+15)	12.7
<b>CHART 1</b>			<b>CHART 2</b>	

In Chart 1 we can see that the *per capita* consumption (+15) in Mexico it is of 7.2 liters, and how that compares to previous years. And in Chart 2 we can observe that per capita consumption (+15) when only considering drinkers, is of 18 liters for men and 5.7 liters for women (*refer to* Infograph 17).

With the purpose of transmitting this information and promoting a bigger impact with people, we can mention some exercises in which this is converted into number of standard drinks.

So, how many standard drinks (SD) are 7.2 litres, 18 litres or 5.7 litres equal to?

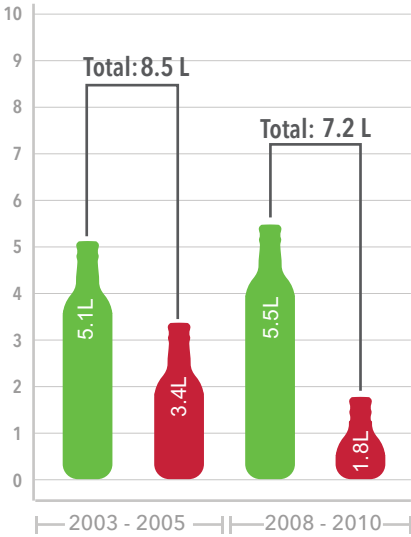
<b>PER CAPITA CONSUMPTION IN MEXICO/EQUIVALENCE IN NUMBER OF STANDARD DRINKS (SD)</b>			
Total PCC (+15)		PCC (+15) Only drinkers (Male)	PCC (+15) Only drinkers (Female)
In a year	<b>7.2 L</b>	<b>18 L</b>	<b>5.7 L</b>
	<b>434.78 SD</b>	<b>1086.95 SD</b>	<b>344.20 SD</b>
In a day	<b>1.20 SD or 19.87 ml EtOH</b>	<b>3.01 SD or 49.99 ml EtOH</b>	<b>0.95 SD or 15.83 ml EtOH</b>

These equivalences show us, for example, that 18 litres of ethanol are equal to 1086.95 standard drinks in year, or to consuming 3.01 standard drinks a day (49.99 ml EtOH), without a single rest day during the whole year.

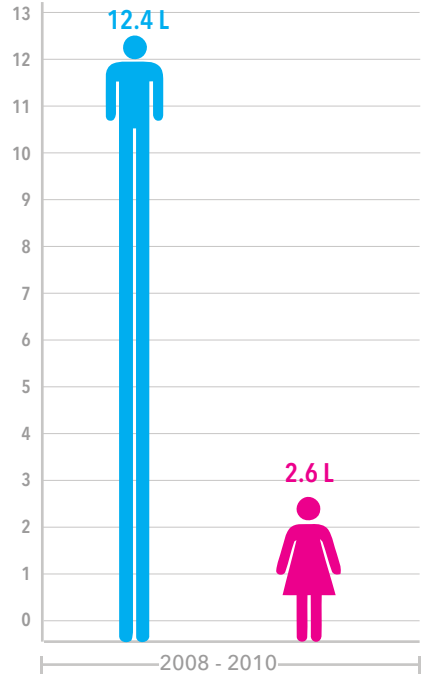
Through the Standard Drink we can manage the information in a more user-friendly way. At a first glance, it might not be alarming to know that one drinks 18 litres of ethanol a year, but it causes more of a shock to learn that one drinks 1087 standard drinks approximately (355ml beers or tequila shot glasses). This helps people identify with the information, thus elevating the possibility of generating awareness regarding the topic (refer to Infograph 18).



Per capita alcohol consumption (+15)  
in Mexico (in litres of pure alcohol)

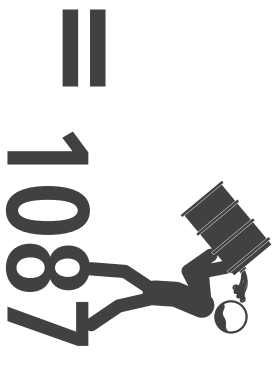
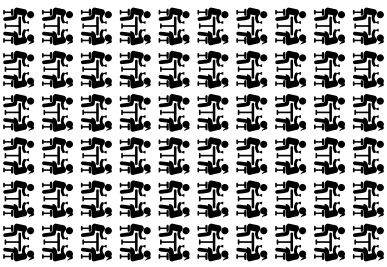
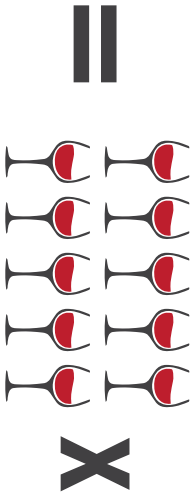
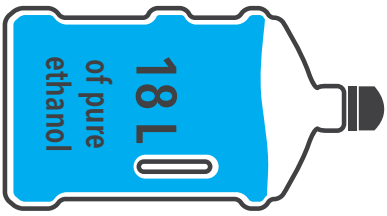


REGISTERED UNREGISTERED



Per capita alcohol consumption (+15) only considering drinkers (in litres of pure alcohol), 2010





Standard drinks of 13g

Equals drinking  $\longrightarrow$  10.45 Standard Drinks  $\longrightarrow$  in 104 occasions  $\longrightarrow$

**NOTE:** An exercise in converting *per capita* alcohol consumption of drinking men to standard drinks

## WHAT IS A HARMFUL USE OF ALCOHOL?

The term, “harmful use of alcohol” is created due to the necessity of being able to characterise a form of consuming alcoholic drinks that is considered risky, in view of possible damage either to the person or to society as a whole.

In the Global Strategy to Reduce the Harmful Use of Alcohol (2010) of the World Health Organization (WHO), ‘harmful use of alcohol’ is defined as “broad and encompasses the drinking that causes detrimental health and social consequences for the drinker, the people around the drinker and society at large, as well as the patterns of drinking that are associated with increased risk of adverse health outcomes. The harmful use of alcohol compromises both individual and social development. It can ruin the lives of individuals, devastate families, and damage the fabric of communities.”

For FISAC, the harmful use of alcohol includes the following elements (*refer to Infograph 19*)

<b>UNDER-AGED DRINKING</b>	<b>IN THESE SITUATIONS THERE ARE NO MODERATION MEASURES.</b>
<b>DURING PREGNANCY OR NURSING</b>	
<b>EXCESSIVE CONSUMPTION (4 OR MORE STANDARD DRINKS FOR WOMEN, 5 OR MORE STANDARD DRINKS FOR MEN)</b>	
<b>BINGE DRINKING (FORM OF ACCELERATED INTAKE OF ALCOHOLIC DRINKS IN SHORT PERIODS OF TIME, USUALLY ASSOCIATED WITH COMPETITIONS OR CHALLENGES)</b>	
<b>COMBINED WITH DRIVING AUTOMOTIVE VEHICLES</b>	
<b>DURING MEDICAL TREATMENT</b>	
<b>IN PEOPLE WITH A CHRONIC ILLNESS</b>	
<b>ILLEGAL ALCOHOL</b>	

The ability to avoid the harmful use of alcohol, among other things, highlights the importance of being responsible. The Standard Drink, along with other measures of moderation, are not necessarily advisable in every situation and for every person: *not all moderate drinkers are always responsible ones*. For example, a pregnant woman or a machinery operator that consume alcoholic drinks are being irresponsible even when their consumption is moderate; in both cases, the advisable thing is that they don't drink alcohol at all. *Responsibility should be above any form of consumption*.

The National Commission Against Addictions (CONADIC) tells us that "Mexico joined the Global Strategy to Reduce the Harmful Use of Alcohol in May of 2010, in which it currently serves as a member of the group of the Americas in favour of Reducing the Harmful Use of Alcohol. [Since then,] the National Strategy to Reduce the Harmful Use of Alcohol has been developed and consists of a wide range of actions guided to solve the problems caused by the Harmful Use of Alcohol, with the purpose of being able to reduce its sanitary and social consequences in the long run"<sup>10</sup>. Among these actions we can find "the implementation of continuous actions of prevention in the harmful use of alcohol."

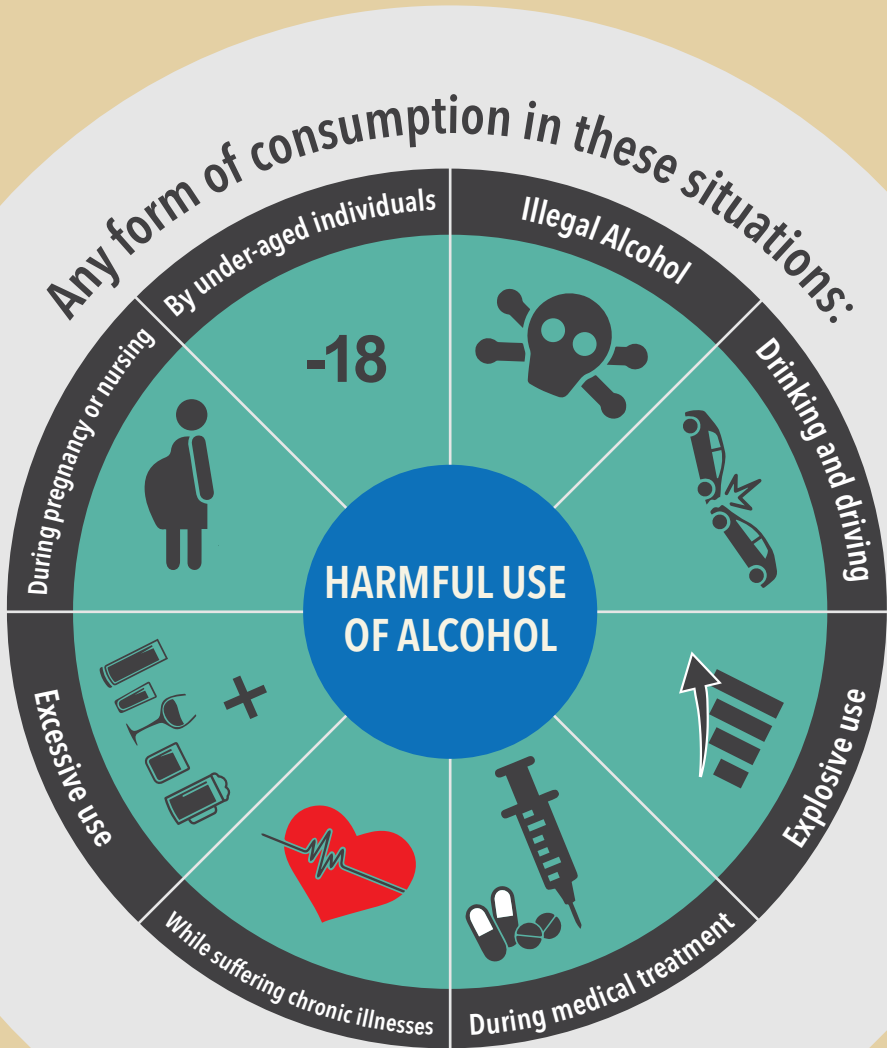
Also, in CONADIC's document entitled "Courses of Action of the Programme for Prevention and Attention of Addictions (2015-2018)"<sup>11</sup> they say they're looking to "design and validate" the national strategy to reduce the harmful use of alcohol. The 'standard drink' can be a part of this and other health strategies.

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10 Document available online at: [http://www.conadic.salud.gob.mx/pdfs/informe\\_alcohol.pdf](http://www.conadic.salud.gob.mx/pdfs/informe_alcohol.pdf), recovered October 21st 2014

11 Document available online at: <http://www.conadic.salud.gob.mx/pdfs/154LINEASACCION.pdf>, recovered April 14 of 2015

# WHAT CONSTITUTES A HARMFUL USE OF ALCOHOL?



## WHAT IS CONSIDERED TO BE EXCESSIVE USE OR ABUSE?

In the document entitled "Alcohol"<sup>12</sup> of CONADIC's Technical Secretariat abuse is defined as, "A drinking pattern of more than four drinks at every occasion, more than three times a week, in men, and three every occasion, in women" (refer to Infograph 20).

Also, excessive use can be defined as that which surpasses the measures that Dra. Maria Elena Medina Mora mentions in the book **Alcohol and Public Policies**, published by the Colegio Nacional (National School) in 2013, where the limits of what represents a low-risk consumption rate in our country are:

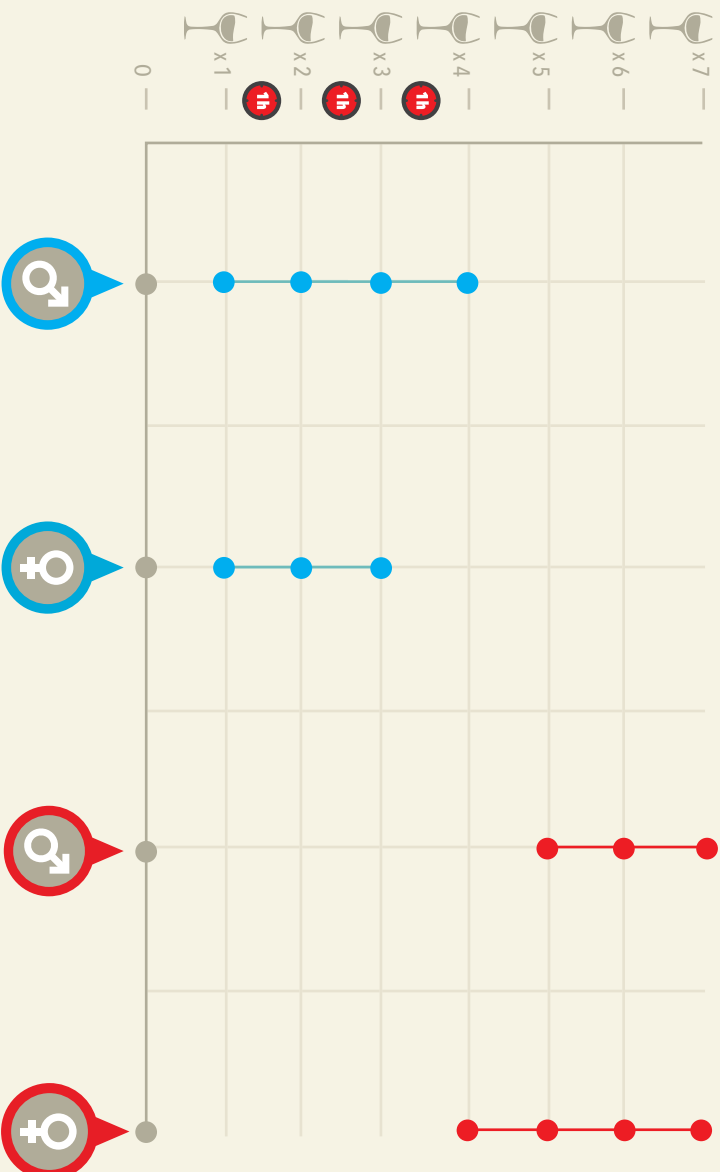
- **Women:** "...drink no more than 9 glasses per week, with a maximum of 3 each occasion and in intervals of at least one hour between drinks. In the event of being pregnant or planning on becoming pregnant, the best advice is to abstain completely." It's considered risky use after 3.5 drinks (High-risk use encloses 41 to 60g).
- **Men:** Drinking "no more than 12 glasses per week, with a maximum of 4 each occasion and, same as with women, no more than one every hour." It's considered high risk use after 5 drinks (High risk use goes from 61 to 100g).
- **Both:** Abstinence if one is dependent, ill or under medical treatment.

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12 Available online at: <http://www.conadic.salud.gob.mx/pdfs/publicaciones/guiaalc.pdf>; Recovered October 21st 2014

*The standard drink is a very important tool for prevention programmes regarding the harmful use of alcohol, in that it helps people to adhere to these sorts of limits.* Measuring how much pure alcohol one drinks isn't a common practice in our country. People usually serve their drinks in an intuitive way and they easily lose count, resulting in generally not knowing how many drinks they have drunk (refer to *How do we Serve or Have a Drink in Mexico?*). Due to this, it is important to contribute in Mexico to a drinking culture that includes the notion of a standard drink.

# What constitutes a moderate alcohol consumption pattern and what an excessive one?



**MODERATE USE**  
(With intervals of an hour between drinks)

**EXCESSIVE USE**

(According to CONADIC)



# 2

Part Two

The Standard Drink should be accompanied by additional information that favours its understanding and gives it a bigger impact. It is necessary to create an informative context that allows to raise awareness on its utility and possible applications. *It is important to say that knowledge on alcohol should be accompanied by a program of **life skills and tools** (mentioned later on) if it is to succeed in becoming a strategy of the utmost utility in preventing a harmful use of alcohol.*

## WHAT ARE THE PHARMACOKINETICS OF ETHANOL?

There are many individual factors that intervene in how ethanol affects the organism: weight, height, sex, the presence of foods in the stomach, tolerance, general health state, psychosocial factors, mood, etc. (refer to *Factors that intervene in the effects of ethanol in the organism*), all of which hinder the establishment of specific effects that would be produced by drinking a certain amount of alcohol.

Pharmacokinetics is the science that refers to how a substance is assimilated in the human body. It includes the processes of absorption, distribution, metabolism and elimination of any given substance. These processes are carried out in the interior of the organism from the moment in which ethanol is ingested. Let us go through all of them briefly.

**Absorption:** It is the passing of ethanol to the bloodstream. Ethanol enters through the mouth, goes down the esophagus and arrives to the stomach. Once there, approximately 20% of all consumed ethanol will be integrated into the bloodstream, the rest will be absorbed in the small intestine. The disparity in absorption rates is due to the intestine's surface that has numerous villi that facilitate the passing of ethanol into the bloodstream. If the stomach has food, it will cause the ethanol to be absorbed at a slower rate since the pylorus, the inferior opening of the stomach that regulates the passing of food to the intestine, is closed during digestion. In addition to this, the presence of fats in the food will further slow down the absorption of ethanol.

**Distribution:** Once the ethanol passes into the bloodstream, it is distributed throughout it, to all the organs. When the alcohol arrives to the brain its effects begin to be felt; the severity of which depend on the amount of ingested alcohol and of consumption speed.

**Metabolism:** Approximately 90% of all the ethanol that a person ingests metabolises in the liver through the action of an enzyme called *Alcohol Dehydrogenase*, or ADH. Ethanol's molecule breaks down and transforms into acetaldehyde<sup>13</sup> which, in turn, will become an acetate by the action of the ADH enzyme, until it can finally be eliminated as carbon dioxide and water. The body of a healthy adult man has the ability to metabolise the content of a Standard drink of 13g or 16.560 ml of ethanol in approximately 1 hour. In the case of a healthy adult woman, this time is of approximately an hour and a half, due to a smaller amount of Alcohol Dehydrogenase (ADH) enzyme.

**Elimination:** As was mentioned, approximately 90% of all the ethanol ingested is metabolised in the liver and eliminated from the body in the form of carbon dioxide and water. The approximate 10% that remains, skips the metabolic process and is eliminated directly through urine, tears, perspiration, feces, exhaled air, and maternal milk.

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<sup>13</sup> Many of ethanol's noxious effects in the long run (e.g., developing hepatic damage, cancer, general uneasiness, etc.) are related to storing acetaldehyde (Dasgupta 2011).

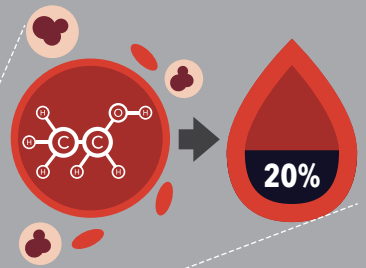
# WHAT ARE THE PHARMACOKINETICS OF ETHANOL?



When the alcohol arrives to the brain its effects begin to be felt

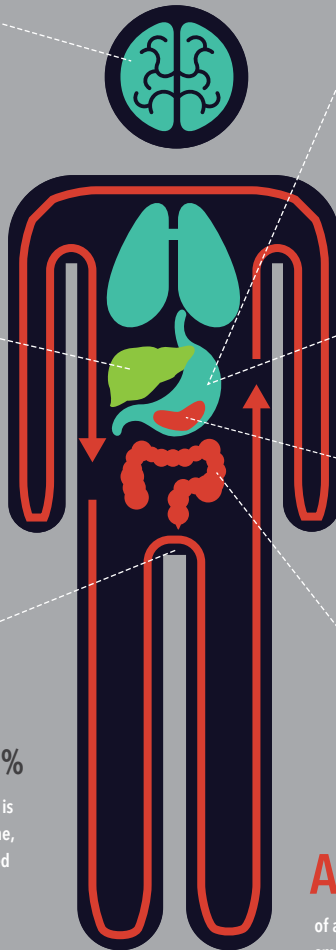
## Approximately 20%

of all consumed ethanol is absorbed by the stomach to the bloodstream



## Approximately 90%

of all the ethanol that a person ingests metabolises in the liver through the action of an enzyme called Alcohol Dehydrogenase, or ADH



food will cause the ethanol to be absorbed at a slower rate



## Approximately 10%

skips the metabolic process and is eliminated directly through urine, tears, perspiration, feces, exhaled air and maternal milk



## Approximately 80%

of all consumed ethanol is absorbed by the small intestine into the bloodstream

## WHAT ARE THE PHARMACODYNAMICS OF ETHANOL?

Pharmacodynamics refers to all those biochemical and physiologic effects that ethanol has on the organism, basically in the Central Nervous System (CNS). When the ethanol molecules arrive in the brain, complex interactions begin with nerve cells, neurotransmitters and electric impulses.

Ethanol is a central nervous system depressor, since it gradually reduces the performance of cognitive, sensory and motor functions like, coordination, perception, planning, judgement, social inhibition, eye vision, reaction time, and it has a similar effect as that of anesthesia. The rate in which these functions are affected will depend on the amount of ethanol consumed, as well as the time in which it was consumed. If ingestion is explosive or excessive, the possibility of suffering or causing an accident, of damaging one's organism, or of experiencing any other kind of negative consequences, increases significantly.

There is a great deal of specialised texts because the changes and interactions between ethanol and the brain are very complex. However, some basic information on the action ethanol has on some neurotransmitters can be extracted:

- **GABA (*Gama-Aminobutyric Acid*):** It's the main CNS inhibitor. Ethanol reinforces this inhibition effect, generating a sedative and anesthetic effect.

- **Glutamate:** It's the main excitatory substance of the CNS related to learning processes and memory. Ethanol blocks its receptors, making the electric impulses in the brain slower.
- **Dopamine:** In a secondary way, ethanol activates the brain's so-called "reward system" by elevating the normal level of dopamine, a neurotransmitter associated with the reinforcement of behaviour and feelings of euphoria.

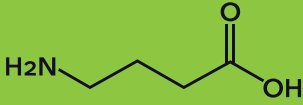
In the same sense, alcohol triggers the production of endorphins by interacting with the pituitary gland. These substances are also associated with sensations of pleasure and well-being.

The multiple alterations that ethanol produces in the organism and the depressing effect it has on the CNS, are the reasons one experiences a decrease in basic cognitive functions, such as thought and motor skills. This is why activities like driving an automobile become very dangerous under the effects of ethanol.

# WHAT IS THE PHARMACODYNAMICS OF ETHANOL?

Ethanol is a central nervous system depressor.  
It generates sluggish reflexes and alters judgement and control of one's behaviour.

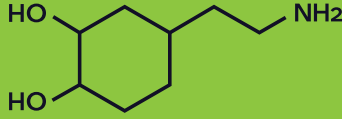
The action ethanol has on some neurotransmitters



GABA (Gama-Aminobutyric Acid)



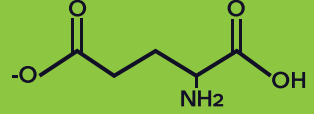
Sedative and anesthetic effect



Dopamine



Associated with the reinforcement of behaviour and feelings of euphoria



Glutamate



Hinders memory and learning processes.





## **BLOOD ALCOHOL CONCENTRATION OR CONTENT (BAC)**

As A.W. Jones (in: Carson DeWitt, 2001) mentions, the BAC is the amount of ethanol that is circulating in one's bloodstream. The concentration increases as one consumes more ethanol. It is expressed as ethanol's weight in a determined amount of blood, for example, grams per litre (g/l) or grams per decilitre (g/dl).

It is common to find that BACs are reported in different measuring units according to the country from which the information comes. For example, in Great Britain it is usually reported as milligrams per one hundred millilitres (mg/100ml), and as milligrams per millilitre (mg/ml) in several European countries. It is also frequent to find it reported in milligrams per decilitre (mg/dl) and grams per litre (g/l), among others (Carson DeWitt 2001). Due to this, it is important to double-check what measuring units are being used in any given document, so as to not confuse data.

In 1932 the Swedish chemist, Erik Matteo Prochet Widmark (1889-1945), developed an equation to determine the BAC, considering several factors: amount of ingested ethanol, time lapsed since the last drink, weight, distribution rate and rate of elimination of ethanol. In scientific and legal texts we can find multiple versions and reviews of this formula, since it usually changes according to new discoveries considering the pharmacokinetics of ethanol; additionally, the different measuring units used by each country can also suffer some adaptation in the formula, commonly used for medical and legal purposes (e.g., road accidents). The BAC

can also be determined through blood, urine and exhaled breath exams (refer to *How does the Breathalyser Work?*).

Since 2003, Mexico City has implemented a programme that includes the breathalyser test to detect drivers that have an alcohol concentration in exhaled breath that may represent a greater risk in causing road accidents.

In Infograph 23 we reproduce a chart found in the "Guide for medical emergencies regarding the treatment of intoxication, product of psychoactive substance abuse for doctors, nurses and paramedics" (2013) by Dr. Raúl Jesús Gerardo Fernández Joffre, in it we can see the clinical state related to certain percentages of blood alcohol (BAC).

It is important to point out the differences between Blood Alcohol Concentration and Breath Alcohol Concentration (BrAC). In Mexico City, the registered BrAC in a breathalyser test should not exceed 0.40mg/l, if it does, the person is remitted to the Administrative Sanctions and Societal Integration Centre, commonly known as "El Torito" ("The Little Bull") and must stay there to fulfill a sentence that varies from 20 to 36 hours of arrest<sup>14</sup>; their car is impounded (only if, at the moment of the test there are no sober parties that can drive it home). We should be careful not to confuse the breathalyser with a BAC reading, i.e., a 0.40mg/l (milligrams per litre) reading in a breathalyser would amount to approximately 0.8g/l (grams per litre) in blood. As we have mentioned, measuring units may vary, therefore it is necessary to pay special attention to them.

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<sup>14</sup> Article 31 of the Metropolitan Traffic Code (2012)

In Infograph 23, a chart is shown based on the one found in the National Commission for the Prevention of Accidents (CONAPRA)'s "National Alcoholometry Programme" (2010), where we can see the equivalences between BAC and BrAC percentages.

In the same document we find a comparative table (*refer to* Infograph 23) that shows equivalences between BrAC and its effects on the organism.

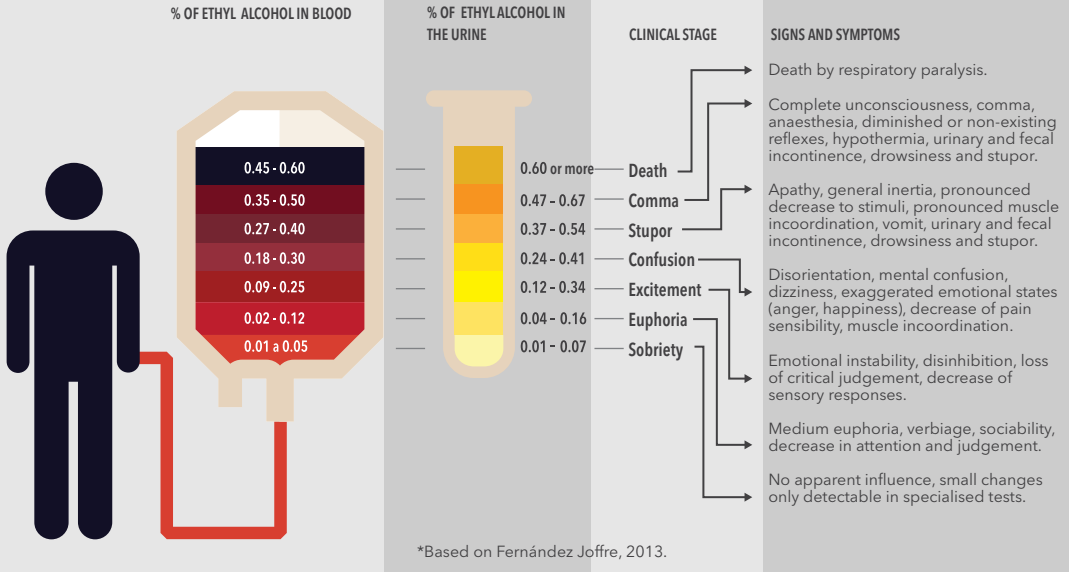
*Knowing this information may serve as a guide, but it should not be considered as something definitive or immutable.* The effects ethanol has depend on many factors that prevent making precise associations between specific amounts of ethanol and their repercussions in the organism (*refer to Intervening Factors in Ethanol's Effect on the Organism*). However, it proves quite useful when making prevention campaigns against the harmful use of alcohol and campaigns promoting the preservation of health and life. The Standard Drink is a fundamental element since international measurements are based on the number of standard drink units or drinks consumed. It is essential to keep in mind the person's general health conditions, if they have eaten, if they have developed tolerance, and even their mood. These bits of information are extracted from a large group of experiences, therefore individual differences are lost in the whole.

It is important to consider this so that the information doesn't allow confusion to arise, making us think that these effects will be experienced by everyone in the same way and in the exact same

sequence of physical and behavioral manifestations. Regardless, the recommendation is to never mix drinking with driving. In CONAPRA's document they refer to the BrAC ranges, since it isn't possible to know exactly how many standard drinks are equivalent to any given reading by the breathalyser.

# BLOOD ALCOHOL CONCENTRATION (BAC)

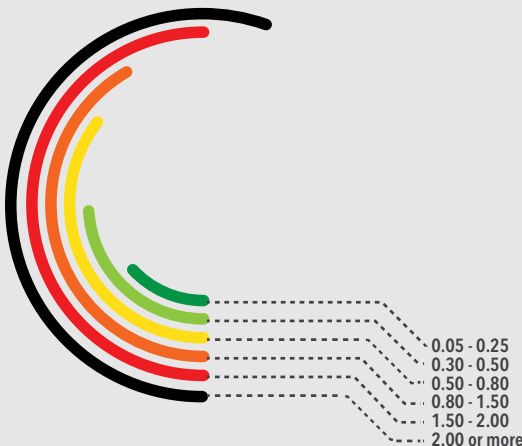
"Some clinical manifestations of the different stages of acute ethyl alcohol intoxication"



% OF ALCOHOL IN BLOOD %BAC g/dl	GRAMS OF ALCOHOL IN 1 LITRE OF BLOOD g / l	MILLIGRAMS OF ALCOHOL IN 1 LITRE OF EXHALED AIR mg / l
0.020	0.200	0.095
0.040	0.400	0.190
0.060	0.600	0.286
0.080	0.800	0.381
0.100	1.000	0.476
0.120	1.200	0.571

\*Based on CONAPRA, 2010

## RELATIONSHIP BETWEEN THE BrAC AND ALTERATIONS IN THE ORGANISM



INFOGRAPH. 23

\*Based on CONAPRA, 2010

## **WHY IS IT SO DANGEROUS TO DRIVE UNDER THE INFLUENCE OF ALCOHOL?**

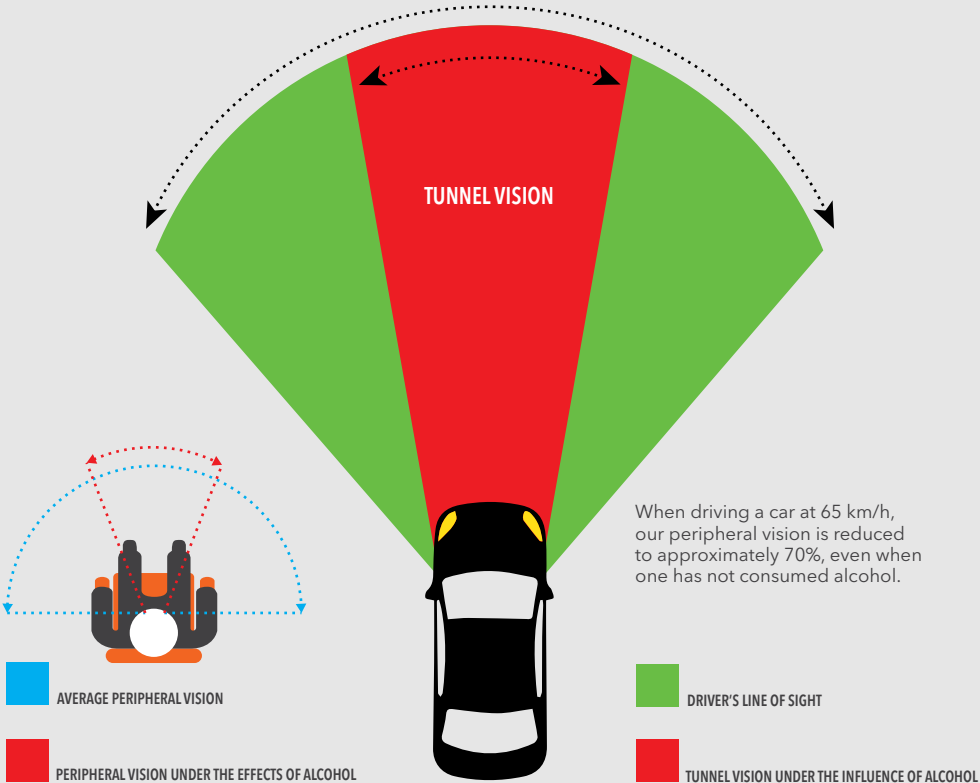
The direct relation between drinking and driving is that the depression of the CNS leads to a longer response time to stimuli (by the individual), the decrease of gross and fine motor skills; at the same time, peripheral vision is reduced gradually until one has *tunnel vision* (e.g., not seeing a person crossing the street or the change of a traffic light and braking, not being able to see moving objects at one's side). Added to this is that ethanol alters one's judgment and impulse control, both of which can play a role in driving recklessly. This fact elevates in great measure the risk of suffering a traffic accident. As can be observed in Infographs 23 and 24, the consumption of ethanol alters a large amount of functions necessary to drive an automobile.

# WHY IS IT SO DANGEROUS TO DRIVE UNDER THE INFLUENCE OF ALCOHOL?

## DECREASE OF GROSS MOTOR SKILLS



## DECREASE OF FINE MOTOR SKILLS



## HOW DOES THE BREATHALYSER WORK?

Let's remember that small quantities of ethanol escape the metabolic process carried out in the liver. Using this information as a foundation, and considering the danger that driving under the influence of alcohol poses, "Breathalysers"<sup>15</sup> were developed. They are devices created to measure the quantity of alcohol present in exhaled air, thus obtaining a representative sample of the BAC that a person has. Ethanol arrives to the lung alveoli, where -through an exchange of gases- small quantities of ethanol are liberated in each exhalation. The "National Programme on Alcoholometry" (2010) offers us a detailed description of this: "The exchange of alcohol in blood to breath alcohol happens in the alveoli. Alveoli are tissue sacks provided with blood by the heart. The walls of these tissues are very thin and permeable to certain molecules, alcohol being one to them. By diffusion, the molecules of alcohol in alveoli capillaries, evaporate in the lungs, thus being detectable in the breath. As a result, a proportional amount of alcohol in blood passes to the alveolar sacks in the lungs. It is therefore possible to analyse a sample of alveolar air to determine the concentration of alcohol in breath, and using this, accurately establish how much alcohol is in the blood at that moment."

Knowing this is fundamental to complement what has already been discussed regarding the consumption of alcoholic drinks.

Many recommendations made on what constitutes low-risk alcohol consumption, are based on medical knowledge regarding the

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15 "Portable Evidencial Breath Analyser" according to the PROY-NMX-CH-153-IMNC-2005. Mexican Norm on Breathalysers. Available at: [http://conapra.health.gob.mx/Normatividad/Laws/Norma\\_Mexicana\\_Alcolimetro.pdf](http://conapra.health.gob.mx/Normatividad/Laws/Norma_Mexicana_Alcolimetro.pdf)

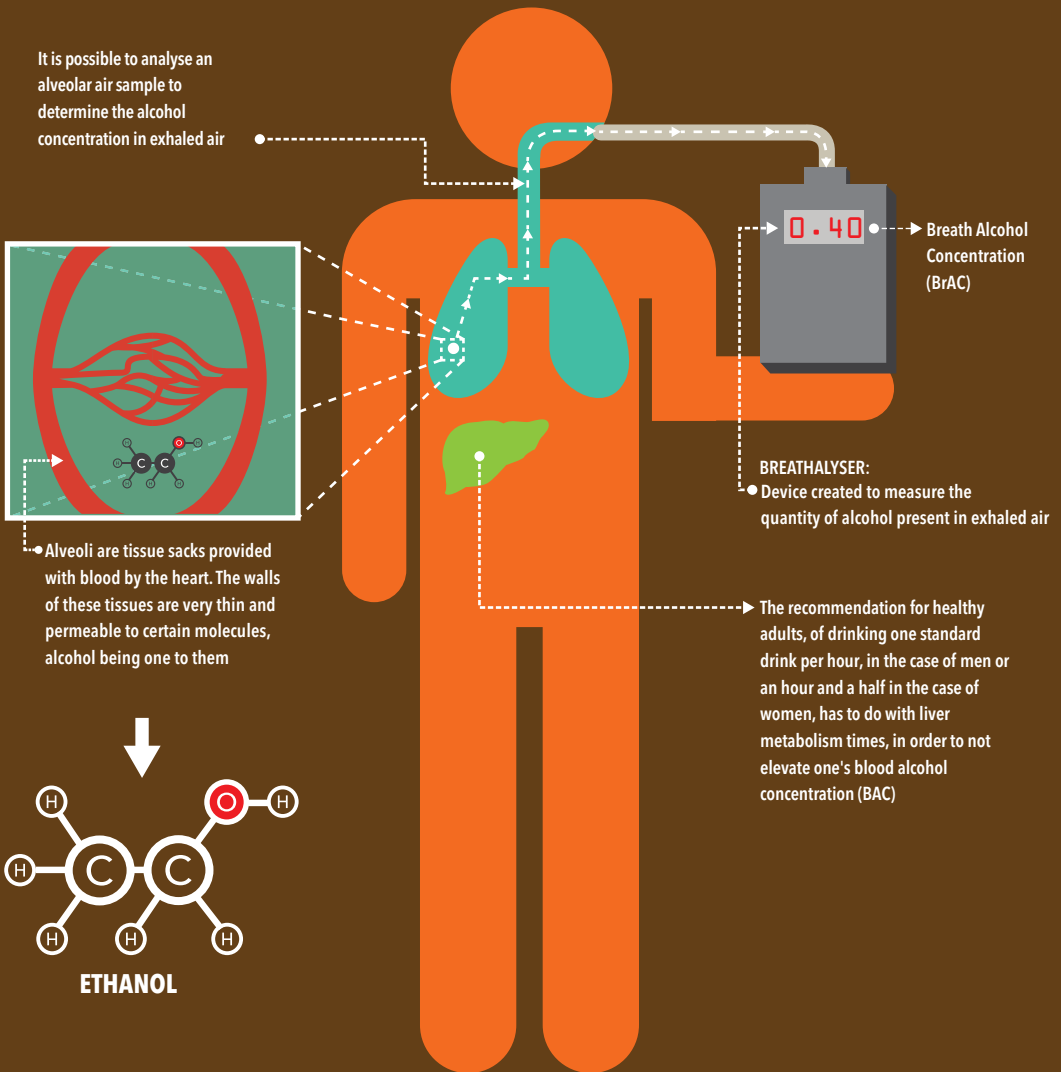


different processes alcohol is subject to in the organism. For example, the recommendation of drinking one standard drink per hour in the case men, and one and a half hours, in the case of women, has to do with liver metabolism times, in order to not elevate one's BAC.

It is important to have all the information within the population's reach so that, with this knowledge, they can make a habit of developing their own preventive strategies, because when people make the bad decision of driving after having ingested alcohol, what is at risk isn't only their health, but also their belongings, their physical integrity, and even their life, not to mention that of their relatives and third parties . It is necessary to work with society as a whole in order to change the mistaken impression that some have regarding the breathalyser, and to understand that it is a programme that saves lives, as opposed to thinking that it is merely restrictive.

It is of the utmost importance to stress the fact that there is no "safe" amount of alcohol in the bloodstream that would allow one to keep the control necessary to drive accurately and with safety. We strongly recommend that **who ever decides to drive, not drink alcohol** and take alternative measures so as to not endanger oneself or others.

# HOW DOES THE BREATHALYSER WORK?



There is no "safe" amount of alcohol in the bloodstream that allows one to maintain the control necessary to drive with precision and safety.

## **INTERVENING FACTORS IN ETHANOL'S EFFECT ON THE ORGANISM**

The Standard Drink is a concept that can become an easy-to-understand aid when trying to offer recommendations for a moderate consumption of alcohol. However, as we have already mentioned, there are several individual factors that determine the effects of ethanol in each person. These differences inadvertently encourage the establishment of myths, since the experience of some people seems to contradict the information provided by the many sources of information that speak of alcoholic drinks and their effects. It is important to take into account all the intervening factors so as to have a wider vision of how ethanol acts upon the organism in each circumstance, and, to therefore, have elements that allow warning for the general population in an extensive and precise way, thus contributing to risk prevention (*refer to Infograph 26*).

**Consumption speed:** If a moderate quantity of standard drinks for women (up to 3 SD) and men (up to 4 SD) are each consumed in less than an hour and a half or an hour, respectively, ethanol's effects will become evident quickly. The great amount of ethanol accumulated in the organism will elevate the BAC hastily. To avoid binge drinking, it is recommended to drink slowly, to alternate with non-alcoholic drinks, and to space drinks over at least an hour to give time for the body to metabolise and eliminate the ingested ethanol. The consumption speed and the amount of ethanol ingested have a strong relationship with the BAC: if much

is drunk in little time, the BAC levels will suffer a sharp rise and the person will suffer acute intoxication. The harmful use of alcohol has many associated dangers, such as: combining drinking and driving, participating in risky sexual relations (e.g., those ending in unplanned pregnancies or sexually transmitted infections -STI-), not to mention the risks to the health of others.

**Food in the stomach:** When ethanol arrives to a full stomach, its absorption time is delayed. The pylorus is closed thus impeding the passage of ethanol toward the small intestine, from which it can quickly move to the bloodstream. Ethanol isn't very soluble in fats, therefore, if one has eaten fatty foods the absorption time will slow down even further. In view of this, it is recommended to eat before drinking and to continue to do so, while one drinks (appetizers, snacks). If, in addition to this, the consumption of alcoholic drinks is responsible and moderate, BAC will not rise abruptly, nor will negative consequences of alcohol abuse appear.

**Amount of ethanol in the drink:** The standard drink teaches us that all drinks contain the same amount of ethanol as long as they are served in their corresponding containers and quantities; however, not using standard measurements when consuming alcoholic drinks results in uncertainty in relation to the amount of ethanol being consumed, that could lead to overdrinking, which, in turn, will elevate the BAC at a higher rate. The higher the concentration of ethanol, the more it enters the bloodstream and produces its effects on the CNS. Moderation should be in the drinker.

**Health Condition:** An adult who decides to consume alcoholic drinks should preferably not have any illness, nor be subject to medical treatment, and ideally should be well fed, rested, and hydrated. If the body is not in good health, the effects of the consumed ethanol can be stronger and could end up affecting the person in a negative way.

**Mood or Frame of Mind:** It is not recommended to consume alcoholic drinks to change one's mood. There is a cultural habit of drinking when one is sad, to overcome deceptions, and to forget rifts and disagreements. This is partly due to the fact that many people think ethanol brings happiness or acts as a stimulant because it initially provokes euphoria and disinhibition. However, as previously mentioned, it is a CNS depressor, so, in reality, it may cause a larger decline in one's mood. The consequences of alcohol consumed in abundance will be added to the problems that were there already. It is very important to clarify that ethanol doesn't produce any given mood, but by depressing the CNS, it disinhibits behaviour and alters impulse control, frequently causing the surfacing of emotions that were already in our interior but that had not yet been openly and properly processed (refer to Life Skills and Tools).

**Medication:** The presence of medicine in the organism can have complex interactions with ethanol. Some authors group these

interactions in two large groups: pharmacokinetic interactions and pharmacodynamic interactions. The first group refers to alterations in the absorption, distribution, metabolism and elimination of ethanol and medication; the second, are related with alterations in the biochemical and physiological effects that ethanol and medications have on the CNS. This means that mixing medication with alcohol transforms both their action on the organism, either to enhance the effects of a substance, to counteract them or to alter their metabolism and elimination. For example, the antihistamines used to treat flus or allergies may bring on dizziness and drowsiness, but when combined with alcohol, these effects are magnified (Lehr Wagner 2003). There is evidence that alcohol combined with antidepressants or other drugs increases the risk of suffering an overdose (Dasgupta 2011); it is believed that ethanol increases the toxic effects of the drug with which it interacts; on the other hand, they can provoke an effect contrary to that of ethanol. The interaction between ethanol and other substances can lead to hepatic damage and elevates the risk of suffering gastric bleeds, heart attacks and respiratory arrest (Dasgupta 2011). It is for these reasons that alcohol and medications should, under no circumstances, be combined.

**Height/Weight:** A person's height and weight are decisive factors, because the more liquids ethanol has to be diluted in (water, blood, muscle), the less it will concentrate in the blood. Albeit not always, a person's size also influences the size of their liver and a higher

or lower concentration of ADH enzyme. This is important lest we forget that differences exist, even among people of the same sex.

**Differences by sex:** The differences in the effect ethanol has on men and women are due to the fact that an average woman generally is smaller than an average man (both in height and in weight). This implies less water in the body (blood, muscle), not to mention that women tend to have a larger amount of fat (hips, breasts). The body of a woman can be represented as a smaller container, therefore, ethanol will be more concentrated, even when a man ingests the same amount. Also, women have less Alcohol Dehydrogenase (ADH), this makes them metabolise ethanol at a slower rate. Additionally, there are studies that suggest that ADH activity is lower in women's stomachs and livers. All of this means that if a woman and a man of the same height and weight consume the same quantity of ethanol, the concentration and the effects will be greater in the woman. It is important to emphasize that the harmful use of alcohol can lead to any person placing themselves in vulnerable situations that might lead to unplanned sexual intercourse, which in turn may contribute to unwanted pregnancies, acquiring sexually transmitted infections or abuses of different kinds.

**Tolerance:** It is the body's way of growing accustomed to the frequent or common presence of a substance, in this case, ethanol. By being

constantly exposed to the presence of ethanol, the organism adapts by carrying out a series of biochemical and physiologic changes, so that little by little, larger quantities of ethanol are required to experience the same effects that were felt after the first time one drank alcohol. The increase of tolerance happens both in men as in women and it doesn't exempt any person of the bodily damages generated from the harmful use of alcohol. Common excessive consumption has multiple adverse consequences such as irritation, ulcers and pancreatitis in the digestive system; alcoholic hepatitis, fatty liver and hepatic cirrhosis; chronic heart diseases and hypertension in the cardiovascular system; impotence and evanescence of sexual desire; in the case of pregnant women: abortion, premature childbirth, stillbirth and alcoholic fetal syndrome; dysfunctions caused by alcohol use (DSM-5, 2013) and psychological disorders.

Antonio Escotado (1998) mentions that in Ancient Greece, Trasias of Mantinea and his pupil Alexias, seem to have been the first in proposing the concept of "tolerance" as the habituation of the body to the effects of a substance after repeated doses, however, it was Aristotle's student, Theophrastus, who first wrote formally on the matter.

Nowadays, we know that an increase of tolerance over long periods of time comes with a decrease in health and liver integrity, as in that of other organs. At the same time, it elevates the probability



of developing the illness known as alcoholism, which is why it is not recommended to increase one's tolerance under any circumstance. We must also highlight that drinking responsibly and in moderation won't lead to a significant increase in one's tolerance. The standard drink can be a tool that contributes to drink, if that is what one wishes to do, within limits of low health risk.

There are different kinds of tolerance, some of these are: 1) *innate tolerance* 2) *acquired tolerance* and 3) *crossed tolerance*. Some people have the first kind, even if it's the first time that they consume a substance. The second is present in those who consume a single substance regularly, and the third is the one that comes in an indirect way, through the tolerance to another substance, similar to the first because of its interaction with the CNS. For example, those who have the disease of alcoholism have a high tolerance to barbiturates, benzodiazepines and other sedatives that are depressors of the CNS.

It is important to know this whole data set because tolerance is usually a very powerful argument to be inclined to think that the information provided is deceiving or false. Certainly the effects of ethanol are different in each person for a plethora of reasons. A person's tolerance can increase a lot, but it will always have a limit. When the body is very deteriorated by the harmful use of alcohol, the liver reduces its ability to metabolise ethanol, and along with changes in the CNS, this makes tolerance decrease.

Lastly, it is necessary to consider that different types of drinks can trigger different symptoms in a person. The effects of ethanol *per se* should not be confused with those of a particular drink's congeners, which might produce discomfort. Congeners are substances that grant each drink their specific characteristics, such as aroma and flavour. These substances are, among many others, polyphenols, flavonoids and tannins. Some red wines, for example, are rich in tannins which causes that astringent sensation in the mouth. Some people are particularly sensitive to these compounds, causing them to feel headaches or stomach uneasiness when consuming different types of drinks.

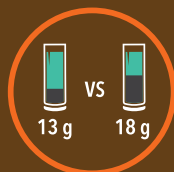
# INTERVENING FACTORS IN ETHANOL'S EFFECT ON THE ORGANISM



Speed of intake



Food in the stomach



Amount of ethanol in the drink



State of health



Mood



Medication



Height / Weight



Differences by sex



Innate tolerance



Acquired tolerance



Crossed tolerance



## THE STANDARD DRINK IN CONNECTION WITH NUTRITION

Much is speculated regarding the nutritional value of alcoholic drinks in Mexican folklore. It is common for people to wonder if alcoholic drinks make you gain weight or if they're nutritious. Another common occurrence is for people to favour some drinks over others thinking they make you gain less weight. The lack of information on these matters leads to confusion. For example, some people believe that drinking beer while one is nursing their young is beneficial for milk production, others believe the calories of ethanol are identical to those in other foods and can therefore be eliminated in the same way. Given the varied beliefs around the topic, it is important to provide clear, science-based information, backed by reliable sources to support and supplement the prevention of the harmful use of alcohol and health care in all aspects and from different perspectives. Keeping track of one's alcohol intake can be very relevant in weight control and general nutritional state.

It is generally accepted that *each gram of ethanol contains approximately 7.0 calories*. To these we must add those from sugars in the drink and from mixers. This results in around 100 calories for each standard drink. In Infograph 27 you may find a chart based on one published by "Dietary Guidelines for Americans, 2005."





When alcoholic drinks are consumed responsibly and in moderation they don't affect the metabolism and absorption of nutrients, but not so when consumed in excess and over a long period of time. There is recorded evidence that some people who habitually abuse alcohol can develop a deficiency of vitamins and minerals, mainly vitamins A, B, and C, Carnitine, Folic Acid, Magnesium, Selenium, and Zinc (Gold and Adamec, 2010), albeit this is mostly due to malnutrition along with chronic abuse (alcoholism). It is important to mention that ethanol calories are of poor nutritional value and therefore cannot be used as substitutes for necessary nutrients found in other foods. In other words, one can affirm that alcoholic drinks contain calories, but very few nutrients. The Standard Drink can be a useful tool when keeping track of one's calorie intake, for weight control or special care purposes. That being said, it is not recommended that people substitute drinks for actual food, because they are not nutritious. Moderate consumption of alcoholic drinks is not associated with weight gain, but that is not the case for excessive consumption (Dietary guidelines for Americans 2010). In "Alcohol and Nutrition: An Overview" (2013) we find that the excessive consumption of alcohol (called 'heavy drinking'), can be associated with weight gain or malnutrition due to alterations in metabolic processes. Since ethanol cannot be stored in the body, the liver concentrates its attention on eliminating it, but by doing so it becomes "distracted" from its normal functions: Assimilation of nutrients (glucose, vitamins, fats, proteins and minerals); transformation of sugars, fats and proteins into energy; elimination of toxins, among many others. The liver carries out more than 5000 functions indispensable for life.<sup>16</sup>

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16 [http://www.higado.com.mx/que\\_es\\_higado.cfm](http://www.higado.com.mx/que_es_higado.cfm), Consulted on 24/06/2014

However, we cannot lose sight that other fundamental factors such as an unbalanced diet, a sedentary lifestyle, high stress levels, metabolic or hormonal alterations, should be taken into account, because the presence of one or several of them, will impact weight control.

# NUMBER OF CALORIES IN EACH STANDARD DRINK

DRINK	Approximate number of calories per 1 ounce	Example of volume served	Approximate total of calories
 BEER	<b>12</b>	<b>12 fl. oz.</b>	<b>144</b>
 LIGHT BEER	<b>9</b>	<b>12 fl. oz.</b>	<b>108</b>
 WHITE WINE	<b>20</b>	<b>5 fl. oz.</b>	<b>100</b>
 RED WINE	<b>21</b>	<b>5 fl. oz.</b>	<b>105</b>
 SPIRITS with 40% ABV	<b>64</b>	<b>1.5 fl. oz.</b>	<b>96</b>

\*Note: The value of ounce used in this chart is of the American liquid ounce, equivalent to 29.57 ml (original chart in English; Based on: Dietary Guidelines for Americans, 2005).

## UNDER-AGED DRINKING

The Standard Drink as a tool to give us a parameter to establish limits concerning the consumption of alcoholic drinks, should not be considered as a recommendation applicable to every person. As FISAC establishes in one of their guiding principles, minors should not consume ethanol, because they have specific biopsychosocial characteristics that place them at higher risk.

- **Biological Characteristics.** The liver of a person who is under-aged is still in development; therefore, its capacity to metabolise an alcoholic drink is different to that of a healthy adult, which may lead to important health risks. Also, a person's brain develops depending on internal and environmental conditions. During growth, the brain increases the number of connections among its neurons, with adolescence being the period in which a process occurs that makes these connections much more efficient, this process is known as "neuronal pruning". Ethanol consumption beginning at early ages can interfere with optimal brain development.
- **Psychosocial Characteristics.** Puberty and adolescence are periods of enormous changes that are fundamental for each individual's future: youths experience their body's transformation and their personality's restructuring. They begin to redefine their identity and to question everything they learned from their parents. At the same time, they start acquiring more independence and responsibilities. All of this makes them



seek peer acceptance and that of other non-familiar groups that give them a certain level of belonging and identity. It can be a confusing and distressing time in which social pressure plays a very important part. Because there is low perception of risk, youths are a particularly vulnerable group regarding the consumption of alcoholic drinks, because it's more likely that they indulge in excesses combined with practices that could compromise their physical integrity, their health and even their freedom if they end up transgressing the law or being involved in an accident of fatal consequences. Beginning alcohol consumption at early ages increases the possibility of suffering an alcohol consumption related dysfunction in the future.

In the *Encuesta Nacional de Adicciones 2011* (National Addictions Survey) we find that in the specific population from 12 to 17 years, alcohol consumption in women increased significantly in relation to previous studies. At this moment in time, adolescent women drink almost at the same rate as the men of the same age, therefore, zero alcohol tolerance in minors should be applied by all sectors of society, beginning at home.

Although some researchers have shown that consuming moderate amounts of ethanol each day or week not only doesn't pose a threat to one's health, but might even be beneficial, it's necessary to clarify that this doesn't apply to under-aged individuals. This and other reasons are why the General Health Law, in its Article 220 establishes that, "Under no circumstance and in no way may

alcoholic drinks be dispensed or provided to under-aged individuals.”

Additionally, in the Federal Penal Code, Reformed July 14th 2014, we can find the following: EIGHTH TITLE. CRIMES AGAINST THE FREE DEVELOPMENT OF THE PERSONALITY. CHAPTER I. Corruption of People Under the Age of Eighteen or of People that don't have the Ability to Understand the Facts or of People that don't have the Ability to Resist. Article 201. “The crime of corruption is committed by those who force, induce, facilitate or offer to one or more people under 18 years of age or one or more people that don't have the ability to understand the facts, or one or more people that don't have the ability to resist any of the following acts:

- a) Regular consumption of alcoholic drinks.

# UNDER-AGED DRINKING

## BIOLOGICAL CHARACTERISTICS

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### Brain

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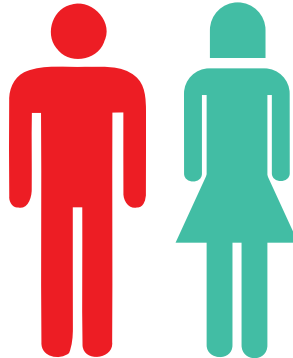
During growth, the brain increases the number of connections among its neurons, with adolescence being the period in which a process occurs that makes these connections much more efficient, this process is known as "neuronal pruning". Ethanol consumption beginning at early ages can interfere with optimal brain development.



### Liver

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The liver of a person who is under-aged is still in development, therefore, its ability to metabolise an alcoholic drink is different to that of a healthy adult, which may lead to important health risks.



## PSYCHOSOCIAL CHARACTERISTICS

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### Peer pressure

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During puberty, people seek peer acceptance and that of other non-familiar groups that give them a certain level of belonging and identity. It can be a confusing and distressing time in which social pressure plays a very important part.



### Low risk perception

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Youths are a particularly vulnerable group regarding the consumption of alcoholic drinks, because it's more likely that they indulge in excesses combined with practices that could compromise their physical integrity, their health and even their freedom if they end up breaking the law or being involved in an accident of fatal consequences.

\* General Health Law Art. 220:

"Under no circumstance and in no way can alcoholic drinks be expended or supplied to under-aged individuals"

## **WOMEN AND THE STANDARD DRINK.**

As has been explained throughout this document, the effects of ethanol on a woman's body are more acute. In summary: the same amount of ethanol will affect a healthy adult woman more than it would a healthy adult man of the same height and weight. It must be understood that both in the short and in the long run:

- ***Women will experience drunkenness faster:*** Because the amount of blood and water in a woman's body is less than that of a man, a woman will reach a higher BAC in less time. Also, some suggest women absorb ethanol more quickly than men (DeWitt, 2001).
- ***Women will experience alcohol's effects for a longer time:*** Numerous studies suggest that the influence of hormonal changes and a lower activity of the ADH enzyme both in the stomach and in the liver, are factors that affect the time it takes to metabolise ethanol, which is longer in women. (Thomasson, R. H. in Galanter, M. (ed.) 2002).
- ***Women will cause more damage to their bodies:*** Several studies suggest that women develop hepatic damage, cirrhosis and alcoholic hepatitis at earlier ages with smaller quantities of accumulated ethanol than men. It has been seen that women have a greater concentration of acetaldehyde, during ethanol metabolising, this could help explain why the damage to the

body is greater. (Thomasson, R. H. in Galanter, M. (ed.) 2002). The consumption of alcohol in women is also associated to alterations in the menstrual cycle, osteoporosis, sexual deficiency, spontaneous miscarriages, etc. (CIJ 2004).

The above mentioned, places women in a more vulnerable situation regarding the consumption of alcoholic drinks. At present, in Mexico, *per capita* alcohol use (+15) in women is considerably less compared to that of men (WHO, 2014). In "*Mujer y Drogas*" ("*Woman and Drugs*") published by the Youth Integration Centres (CIJ), in 2004 we are able to read about the many social and gender-related problems that intervene in alcohol consumption by women in Mexico.

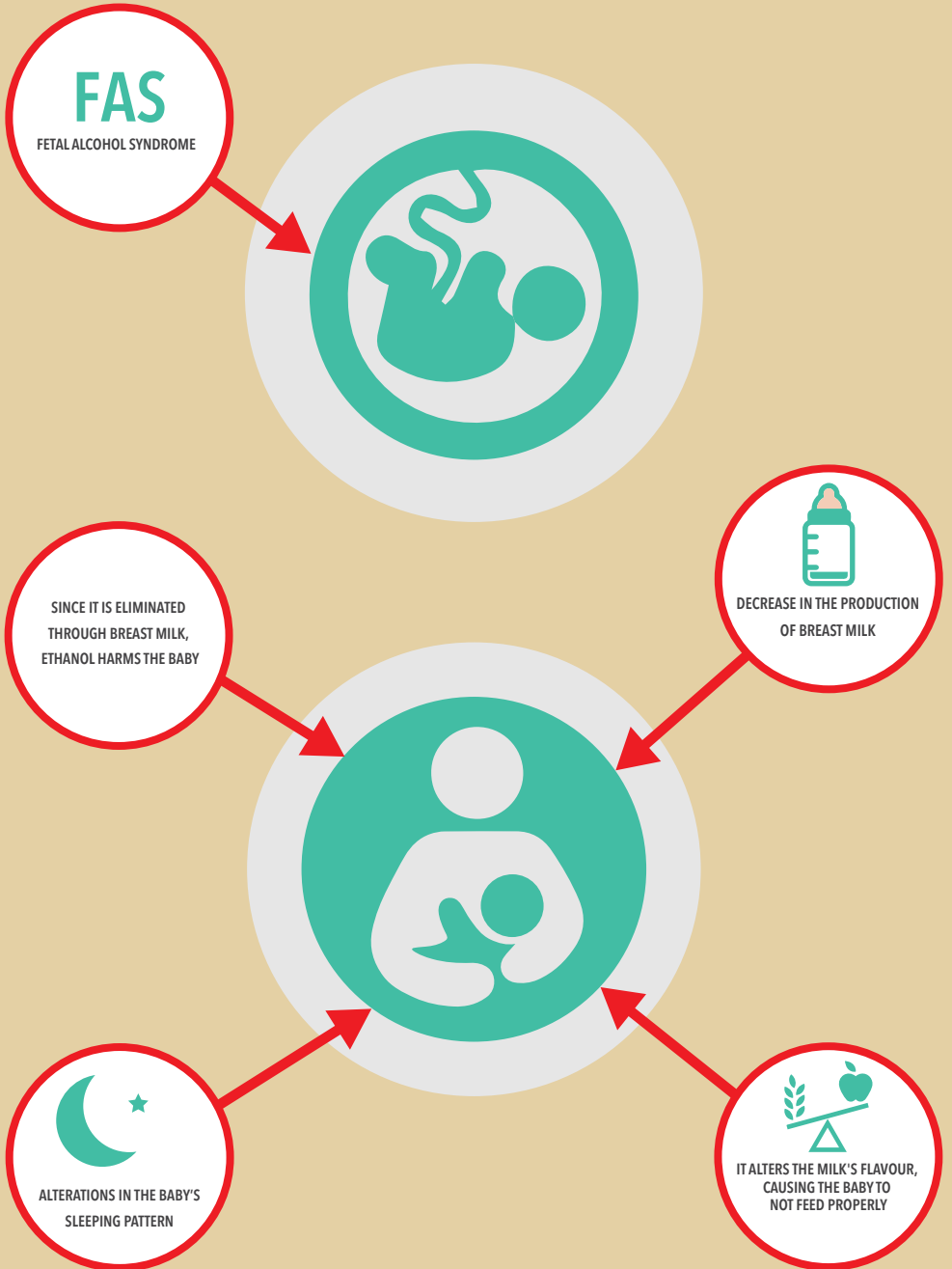
## **ALCOHOL CONSUMPTION DURING PREGNANCY OR NURSING**

There is strong evidence regarding the harm caused to the baby by consuming ethanol during pregnancy. In accordance with information by the International Alliance for Responsible Drinking (IARD), an entire spectrum of alterations related to alcohol use can be present in the baby, the most serious of which is the Fetal Alcohol Syndrome (FAS).

It is important to approach the topic of alcohol use during nursing, since in Mexico it is commonly thought that it is a practice that doesn't represent a risk for the baby. Ethanol reaches the milk and is delivered to the baby in small quantities, however, the baby metabolises alcohol at a much slower rate than an adult. It has been observed that ethanol intake by the baby can alter its sleep pattern, nutrition and can generate hypoglycemia; also, when a woman consumes ethanol while breastfeeding the production of milk diminishes at the same time that the flavour is altered, this can cause the baby to not feed appropriately (Menella 2013). As previously mentioned, several studies suggest that, contrary to popular belief, drinking alcohol interrupts the production of maternal milk (Dasgupta, 2011; Menella 2013).

FISAC recommends abstinence for women if they are planning on getting pregnant, are already pregnant, or are breastfeeding.

# ALCOHOL CONSUMPTION DURING PREGNANCY OR NURSING



## **MEN AND THE STANDARD DRINK**

Speaking of biological differences between men and women helps us gain a better understanding of the process ethanol goes through during its time in the human body. These differences should be understood and used with caution, since the metabolic characteristics that men present do not represent an “advantage” over women.

Many men in Mexican society face risks of another nature. Diverse studies suggest that women are less prone to developing problems related to alcohol abuse than men, because men have a greater difficulty visualising their consumption and behaviours as problematic (Middleton F. K., *et al.*, in: Galanter, M. (2002)). The low risk perception favoured by different social and cultural factors, adds another, more complex layer to taking responsible and conscious decisions. We find examples of harmful use of alcohol in a wide variety of movies, songs and popular proverbs and in them, most times, men carry out these types of behaviours (excessive consumption, risky activities when under the influence, etc.), interweaving bit by bit, the stereotype of what is masculine, correlating excessive use and “immunity” with signs of supremacy when faced with high-risk behaviours, such as driving under the influence, carrying out activities that demand one’s full attention, physical efforts and self-control, like practicing some sports. Another example has to do with some initiation rites for entering diverse social groups that usually promote an excessive consumption of alcoholic drinks as a way of demonstrating one’s “manliness”. This situation has



recently spread toward women as a means of manifestation of hierarchy within groups of peers.

These elements place a large number of men of all ages in our country in situations of considerable risk of suffering many consequences associated with the harmful use of alcohol, and we should prevent these behaviours from being fostered at home and at reunions or parties.

All this indicates that regardless of differences between sexes, the lack of knowledge or the mistaken beliefs surrounding alcoholic drinks and their effects, have a strong impact on people's way of drinking and in the problems that may result from this. This is why all tools built and all practices created for the prevention of harmful use of alcohol, including knowing and using the Standard Drink, should be approached from every angle of society so as to raise awareness within the population.

Standard drinks around the world are sometimes proposed without distinctions among men and women, although great emphasis is made regarding differences in effects that ethanol produces, clarifying that women will present greater effects after consuming the same amount of ethanol than a man. Therefore, an immediate alternative to understanding how long it will take a woman to metabolise a certain amount of ethanol, is to count more time after consuming a Standard Drink than you would for a man (1.5h, instead of 1h).

What is useful at the moment, is to have a clear idea of what the Standard Drink represents and the advantages posed if used, within the parameters that we have mentioned, responsibly and with moderation by healthy adults who consume alcoholic drinks.

## **OLDER PEOPLE AND THE STANDARD DRINK**

In our country, much is speculated surrounding the possible health benefits that come from consuming alcoholic drinks, particularly for the elderly<sup>17</sup>. In popular culture, we can still find several beliefs and ideas similar to those held by our ancestors, so it is still common to hear that a glass helps warm the blood; that it is good for the heart or that it helps cope with ailments proper of this age. Jokes on the matter are commonplace, while others disparage alcohol use by this age group, when in fact most people don't know with certainty just how much alcohol use by the elderly can be harmful, inoffensive, or possibly advisable.

As we have already reviewed in other segments, ethanol consumption, in moderate quantities, doesn't represent a health risk for healthy adults. However, it is necessary to consider that ethanol has complex interactions with medication and could therefore end up interfering with medical treatment. If the consumption is excessive, it can accelerate the normal process of physical deterioration and damage the body, not to mention increasing the possibility of falling, since it affects motor coordination and balance. Anyone that drinks, even moderately, should talk to their doctor for possible interactions between ethanol, medication and their particular clinical record.

It is also necessary to consider that older people metabolise alcohol more slowly (Gold & Adamec 2010), and that they usually have less water and muscle in their body (Carson DeWitt 2001), so that the same amount of alcohol will concentrate more and their

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<sup>17</sup> In Mexico, an older person (or the elderly) is anyone who has reached or surpassed 60 years of age, as is specified by the United Nations Organization (UN) (IAAAM-DF 2014).

organism will eliminate it more slowly. To this, we must add other factors, like if the person was recently or is presently consuming medication or even what their mood is.

Many of the studies where investigators have found a possible correlation between the consumption of ethanol and reducing the risk of suffering a coronary illness, have generally been done in populations that range from 40 to 65 years, in countries where it is common to consume wine in a moderate way and generally accompanied by food. Some authors criticise this fact by pointing out the importance of considering other factors associated with a low incidence of cardiac illnesses, such as diet, exercise, low stress levels, and holiday periods, among others (Lehr Wagner 2003). Those who recognise that ethanol consumption can be beneficial, also admit that the conditions under which this is observed must consider a series of associated factors. It is very important to remember that the benefits generated by ethanol in healthy adults are only present if consumption is moderate (Gold & Adamec 2010) and even then, it is always advisable to speak to one's medical geriatrician or corresponding specialist, depending on each person's situation.

# EFFECTS OF ALCOHOL IN WOMEN, MEN AND OLDER PEOPLE



Will experience drunkenness faster



Will experience alcohol's effects for a longer time



Will cause more damage to their organism



Higher risk of developing problems related to alcohol abuse



Stereotypes of masculinity



Peer pressure



Alcohol use based on popular beliefs



Greater risk of falling



Risks related to interaction with medicine

## EFFECTS RESPONSIBILITY AND MODERATION HAVE ON ALCOHOL USE

In “**The Science Of Drinking: How Alcohol Affects Your Body And Mind**” (2012) by Dr. Amitava Dasgupta, chapter 4, “*Health Benefits Of Moderate Alcohol Consumption*”, we may find a chart in which some of the benefits of a moderate consumption by healthy adults are shown (understanding moderate consumption as 1 or 2 drinks, of 14g each a day). Highlighted among them are the reduction of the risk of suffering a heart attack, of developing arthritis, of developing cardiovascular illnesses, and of developing kidney stones, among other.

In the chapter “*La sociedad actual y el consumo de alcohol*” (**Current society and the consumption of alcohol**; CIJ, 2010) a series of health risks associated with the abuse in the consumption of alcoholic drinks are enumerated. However, we also find other elements that we reproduce thoroughly: “A low level to moderate consumption can suppose certain health benefits, mainly when drinking during meals. [...]”

“The protective effects of alcohol is greater in men than in women in the case of nonfatal heart attacks, in contrast with fatal ones, as well as in Mediterranean country natives, compared with those of other regions. The effects of alcohol, regarding risk reduction, is only of relevance in middle-aged people and older, who have bigger risks of suffering cardiac illnesses.” (Gunzerath *et al.*, 2004)

“Some investigations have determined that an important risk reduction can be appreciated with just 10 grams of alcohol a day. Drinking more than 20 grams of alcohol a day, increases the risk of coronary illness. It seems that alcohol itself is the one that reduces the risk of suffering cardiac illnesses, regardless of the type of alcoholic drink being consumed. Drinking large amounts in a single occasion increases the risk of heart arrhythmias and of sudden death, of a coronary origin. While small quantities of alcohol can protect against cardiac illnesses, large quantities increase the risk and heavy drinking episodes can trigger heart arrhythmias, heart attacks or coronary death (Britton and Marmot 2004).” (CIJ 2010).

This type of information is as important as that concerning the negative health effects. It is necessary to notice that the negative effects are inherent and exclusive to the harmful use of alcohol in healthy adults.

On the other hand, in the “Guide for medical urgencies regarding the treatment of intoxications, product of psychoactive substance abuse for doctors, nurses and paramedics” (2013) by Dr. Fernández Joffre there is a chart where the possible damages to the body after chronic consumption are listed (cirrhosis, gastric ulcers, pancreatitis, nutritional illnesses, endocrine complications, and alcoholic hepatitis, among many others). It is fundamental to stress the fact that the harmful use of alcohol doesn't only eliminate any

possibility of obtaining some health benefit, but rather that the risk of developing illnesses, of suffering accidents and of suffering other negative consequences increases in great measure.

We should consider that anyone can suffer very serious consequences in a single exposure of harmful use of alcohol; it is not necessary to have an alcohol consumption dysfunction or to be a chronic consumer in order to be involved in a traffic accident, to suffer alcohol poisoning or to have risky sexual intercourse.



## **LIFE SKILLS AND TOOLS**

The Standard Drink, along with many other concepts that are part of preventing the abuse of alcoholic drinks, is information that can be offered to those consumers looking to increase their knowledge and awareness in order to promote responsibility in consumption. However, it is necessary that it be accompanied by information that contributes to give the population life skills and tools, so as to build a truly solid foundation for prevention. When we begin to speak of responsibility in the consumption of alcoholic drinks, it is necessary to stress the fact that each person must assume the responsibility of their own life and decisions. Information is a starting point of great importance, but in truth, interaction with the environment will demand each person attitudes, ways of handling one's emotions and taking particular decisions. For this reason, life skills are considered fundamental elements when structuring prevention programmes, and must fit each social group, according to their age or socioeconomic level particularities.

In the document by the WHO entitled, "Life Skills for Children and Adolescents in Schools" (1994) we find that "Life skills are abilities for adaptive and positive behaviour, that enable individuals to deal effectively with the demands and challenges of everyday life." In another document by the WHO, "Health Promotion Glossary" (1998) we find another definition: "Life skills consist of personal, inter-personal, cognitive and physical skills which enable people

to control and direct their lives, and to develop the capacity to live with and produce change in their environment. Examples of individual life skills include decision making and problem solving, creative thinking and critical thinking, self awareness and empathy, communication skills and interpersonal relationship skills, coping with emotions and managing stress.”

The National Commission Against Addictions (CONADIC) in their document “Prevención de las adicciones y promoción de conductas saludables para una nueva vida: Guía para el promotor de Nueva Vida” (“Prevention of addictions and promotion of healthy behaviors for a new life: Guides for New Life Promoter”; 2008), we find that, “Life skills include *know-how* that allows adolescents to exercise their abilities to achieve a healthy development and to be able to face daily life challenges”.

Life skills and tools are fundamental because they make up powerful protection factors, that is to say, both individual and social elements that decrease the possibility that a person carry out behaviors that could be harmful or risky for themselves or their environment, such as the harmful use of alcohol. In order to transmit these skills to youths, it is necessary to have prevention programmes that involve parents, teachers, health promoters and authorities. Also, the creation of community support groups that promote the consolidation of a prevention culture through the cooperation and education in health and life care, since they can guarantee a

multiplying effect of this indispensable and important task.

The life skills and tools that FISAC works with are:

1. **Self-esteem:** It is the value one places on oneself. This assessment falls upon every area of personal experience: the body, the abilities one has, social status, family context and more. Self-esteem can be healthy or unhealthy, because experiencing “negative” emotions is not bad in and of itself. The insistence and intensity of said emotions, can generate risky or self-destructing behaviours, negative assessments of oneself, this may then be considered an unhealthy self-esteem. Self-esteem can constitute a protection factor since it provides the necessary elements for a person to take seriously and consider what is of greater importance and worthy of respect, their values, their body, their decisions or their beliefs. Self-esteem is intimately linked with the social context, so it cannot be understood purely as a subjective issue.
2. **Assertiveness:** It is the ability to express one’s ideas, opinions or emotions in a clear, direct, frank and opportune way. It is common for people to consent to doing things that they otherwise wouldn’t because of social pressure. Promoting the development of assertiveness, can be what is needed to stop invariably conceding to others insistent invitations to consume alcoholic drinks or to consume more than what one wants to.

3. **Values:** They are symbolic categories that define what is “right” from what is “wrong” and they grant significance to people, events and things. Values help give sense and depth to beliefs and feelings. They constitute a protection factor because they allow to meditate on what is truly important for an individual. Friendship, love and honesty are elements that secure a feeling of community, which turns into the foundation of emotional ties, elements that will make a relationship with something or someone resistant and deep. If an individual values life, friendship and their parent’s effort to give them the best opportunities, they might make more responsible decisions, such as not driving if they have consumed alcoholic drinks, thus putting themselves and others they care for, in risk.
  
4. **Spare time:** Promoting the correct use of spare time is important in a prevention programme since by using one’s time in activities that develop the person, one avoids substances like alcohol, becoming the only option to “pass the time”. Each person is different, therefore the activities that can be interesting or amusing may be very different. The use of spare time has subjective, singular and liberating rewards; it is defined from the individual's singularity, that is to say, spare time represents an aspect of one’s personality. It is a way to channel one’s energy and attention into constructive activities that provide personal satisfaction to the individual that reinforce the sensation

that they have taken advantage and enjoyed their time. Some alternatives can be sports, the arts, cultural activities or sciences.

- 5. Life project:** It is everything that one wants to end up being and doing. A life project helps establish short, medium and long term goals; it leads one to meditate on who one is and what it is one wishes. One can say that a life project has to do with dreams and personal yearnings, at the same time, it helps in motivating and giving life sense, without forgetting the importance of living in the present so as to clear the path that leads us to our goals. The life project promotes the prioritization of elements in function of their relevance in reaching objectives or goals and one's personal commitment. A harmful use of alcohol can damage the body and interpersonal and work relationships, thus blocking the realization of one's life project.

All these skills and tools constitute protective factors and they promote the development of a person's resilience, which is the ability to overcome adverse conditions and situations that may present themselves throughout life. They imply handling one's emotions, making decisions and responsibility.

In "Alcohol and Public Policies" (2012) we find that: "It is important to consider that education in life skills is a process that requires a recurrent, repeated and intensive training (UNESCO, 2004), as

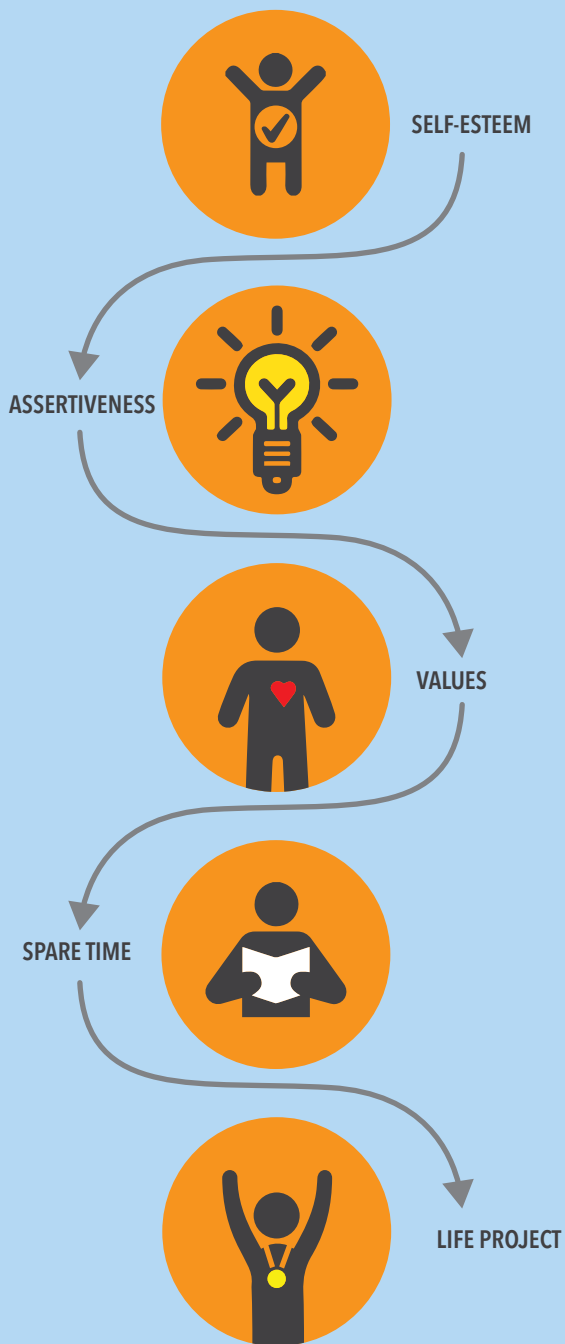
well as a great investment of time and instruction so that the participants practice their new abilities, personally and collectively reflect in order to be able to identify with them, acquire them and translate them into behaviour (ICE, 2005) [...]”.

Speaking of life skills and tools in prevention programmes is equivalent to recognising the need to invite people to think of themselves in a more sincere and deeper way, of leading them to question their feelings and relationships with others. The information provides elements from which it is possible to begin to promote reflection on the reasons behind our acts and emotions. When somebody is drinking in excess under the misapprehension that it is the only way one may relax, have a good time, laugh, make friends, or express a certain feeling, they might not be questioning what is happening within, and what are the intimate and very personal motives that are causing said behaviours and feelings. Problems, far from being solved, can become worse, causing them even bigger problems such as the development of illnesses and, more importantly, exposing oneself, loved ones and third parties to risks, that many times turn into family conflicts, nonfulfillment of life projects or in tragic accidents in which there is loss of life. A programme that supports the development of life skills and tools, while at the same time teaches basic techniques on how to cope with situations and feelings, will help people ponder, in such a way that what results will deeply permeate a person's thoughts

and feelings, thus increasing their self-knowledge, responsibility, satisfaction and confidence in decision-making.

May this work be added to said purpose.

# LIFE SKILLS AND TOOLS





# E

xercises

1. You were given a 1 litre bottle of vodka that has 44% ABV. How much pure alcohol does it contain, both in milliliters and in grams?
2. A person consumes one 500ml beer with 5% ABV, one 73ml tequila with 38% ABV and one 135ml glass of wine with 13% ABV. This person boasts of having drunk 3 standard drinks, is this true? If not, how many standard drinks did he consume?
3. Upon arriving at a reunion, you wish to put in use your knowledge on the Standard Drink by measuring your alcohol intake. On the table there is a bottle of rum that has 35% ABV, How much should you serve in your glass if you want one standard drink?
4. A friend of yours drank three litres of beer that has 4.6% ABV. How many Standard Drinks does that add up to? How much pure alcohol has he consumed in grams and in millilitres?
5. You are a barman and you need to know how many standard drinks you can get from a 750ml (3/4) bottle of whisky with 40% ABV, for your sales control. What should you do?
6. You arrive at party and you find a 30 litres-barrel of beer of 4% ABV. There are 40 people at this party (including yourself) and everyone is drinking. If everyone drank the same amount, how many standard drinks would each person get?

7. Your significant other planned a reunion and has two bottles of red wine, each one is 750ml with 13% ABV. Three more friends attend, each one with their partners, how many standard drinks will each person get?
8. A Martini is made with Gin (2fl.oz.) and Vermouth (1fl.oz), is this a Standard Drink? If not, how could you turn it into one?
9. You arrive at an event and on the table there is a bottle of whisky with 45% ABV. How much should you serve in your 355ml glass in order to obtain a Standard Drink? And, how much mixer (seltzer, soda...) should you pour to fill your glass?}
10. Maria drank in excess because she consumed two 1 litre glasses of michelada\*, at 4.5% ABV. How many Standard Drinks do those two litres equal? And how long will it take for her liver to finish metabolising them?

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\* Translator's note: Beer with a twist of lime and salt

**A**nnex

## TYPES OF DRINKS

A wide variety of drinks with alcohol with varying alcoholic content exist; knowledge and use of the Standard Drink can be of great help to people so they use the information written on the containers and know how much alcohol they are consuming, so as to follow health limits.

Without the information that we have reviewed throughout the text it might be hard to know how much wine of 13% ABV I should serve to obtain a Standard drink. To obtain it, we can use containers marked or specially designed to obtain standard quantities. In the United Kingdom glasses with precise measures were released to help consumers to obtain standard drinks of several beverages (Unit measure cup<sup>18</sup>). In Mexico, the Standard Drink has another value, for which the necessary adaptations would have to be carried out.

The following is a chart where we show different types of drink, in different presentations (volume), their alcohol content, their equivalences in millilitres and grams of pure alcohol and how many standard drinks they are equal to, according to the standard drink portion that NOM's 142 and 047 specify (13g of EtOH, each). Ethanol density was considered at 0.785g to obtain greater precision in conversions.

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18 Ver: <https://resources.drinkaware.co.uk/unit-measure-cup>, revisado el 20/06/2014

Types of beverage	BEVERAGES			EQUIVALENCIES		
	Total Volume	ABV	ml	g	Number of Standard Drinks(13g each)	
<b>Fermented</b>						
<b>Beer</b>	355	ml	0.5%	1.775	1.393	0.11
	355	ml	2.9%	10.295	8.082	0.62
	325	ml	3.6%	11.700	9.185	0.71
	355	ml	3.9%	13.845	10.868	0.84
	355	ml	4.2%	14.910	11.704	0.90
	355	ml	4.2%	14.910	11.704	0.90
	325	ml	4.5%	14.625	11.481	0.88
	330	ml	4.8%	15.840	12.434	0.96
	355	ml	5%	17.750	13.934	1.07
	355	ml	5.5%	19.525	15.327	1.18
	355	ml	5.9%	20.945	16.442	1.26
	355	ml	7%	24.850	19.507	1.50
	355	ml	14%	49.700	39.015	3.00
	<b>Red Wine</b>	4000	ml	11%	440.000	345.400
750		ml	12%	90.000	70.650	5.43
750		ml	13%	97.500	76.538	5.89
750		ml	14.5%	108.750	85.369	6.57
750		ml	15.2%	114.000	89.490	6.88
<b>White Wine</b>	750	ml	14%	105.000	82.425	6.34
<b>Rose Wine</b>	750	ml	8%	60.000	47.100	3.62
	750	ml	9%	67.500	52.988	4.08
	750	ml	13.5%	101.250	79.481	6.11
<b>Champagne</b>	750	ml	12%	90.000	70.650	5.43

Types of beverage	BEVERAGES			EQUIVALENCIES		
	Total Volume		ABV	ml	g	Number of Standard Drinks(13g each)
Sparkling White	750	ml	10.5%	78.750	61.819	4.76
Cider	300	ml	5%	15.000	11.775	0.91
Sherry	750	ml	15%	112.500	88.313	6.79
<b>Distilled</b>						
Rum	1750	ml	35%	612.500	480.813	36.99
	750	ml	40%	300.000	235.500	18.12
	980	ml	40%	392.000	307.720	23.67
Vodka	4500	ml	40%	1800.000	1413.000	108.69
Brandy	700	ml	38%	266.000	208.810	16.06
Tequila	950	ml	35%	332.500	261.013	20.08
	950	ml	38%	361.000	283.385	21.80
	950	ml	46%	437.000	343.045	26.39
Whisky	750	ml	40%	300.000	235.500	18.12
	750	ml	45%	337.500	264.938	20.38
Grape Distillate	940	ml	32%	300.800	236.128	18.16
Cane Distillate	250	ml	26%	65.000	51.025	3.93
<b>Liqueur and creams</b>						
Eggnog	1000	ml	12.5	125.000	98.125	7.55
Whisky Cream	750	ml	17	127.500	100.088	7.70
Rum and coconut Cream	750	ml	20	150.000	117.750	9.06
Plum Liqueur	500	ml	14	70.000	54.950	4.23
Vodka Liqueur	750	ml	15	112.500	88.313	6.79
Herb Liqueur	700	ml	35	245.000	192.325	14.79

Types of beverage	BEVERAGES			EQUIVALENCIES		
	Total Volume	ABV	ml	g	Number of Standard Drinks(13g each)	
<b>Coolers and Canned Cocktails</b>						
<b>Beer with Tomato Juice</b>	355	ml	2.5	8.875	6.967	0.54
<b>Daiquiri</b>	750	ml	4	30	23.550	1.81
<b>Vodka and Cranberry</b>	275	ml	5	13.75	10.794	0.83
<b>Paloma (Tequila-based)</b>	350	ml	5	17.5	13.738	1.06
<b>Whisky With Sparkling Water and Flavouring</b>	350	ml	6	21	16.485	1.27
<b>Herb Liqueur, Cane Alcohol and Flavouring</b>	355	ml	5.9	20.945	16.442	1.26
<b>Vodka Liqueur, Cognac and Fruit Juice</b>	750	ml	17	127.5	100.088	7.70



# Glossary

## A

**ADH:** Alcohol Dehydrogenase

**ABV:** Alcohol by volume

## B

**BAC:** Blood Alcohol Concentration / Blood Alcohol Content

**BrAC:** Breath Alcohol Concentration / Breath Alcohol Content

## C

**C<sub>2</sub>H<sub>5</sub>OH:** Chemical composition of Ethanol

**CIJ:** Youth Integration Centres (Centros de Integración Juvenil)

**CIVyL:** Industry of Wines and Spirits Commission (Comisión para la Industria de Vinos y Licores)

**CNS:** Central Nervous System

**COFEPRIS:** National Commission for the Prevention of Sanitary Risks (Comisión Nacional para la Prevención de Riesgos Sanitarios)

**CONADIC:** National Commission Against Addictions (Comisión Nacional contra las Adicciones)

**CRT:** Regulatory Council of Tequila (Consejo Regulador del Tequila)

## D

**Density ( $\rho$ ) or specific gravity:** It is a measure that expresses the relationship between the mass and the volume of a body or

substance. It is defined as the mass of an object or substance divided by their volume.

**dl:** decilitre(s)

## E

**EtOH:** Ethanol

## G

**g:** Gram(s)

## H

**h:** Hour(s)

**Harmful use of alcohol:** Using WHO's description as a reference, as well as many others made by different organizations, the term "harmful use of alcohol" is employed when speaking of that use which, when alcoholic drinks are consumed, produces detrimental sanitary and social effects:

- In under-aged individuals.
- In pregnant women.
- Excessively
- Explosively
- Combined with driving
- While in medical treatment.
- In people with some chronic illnesses
- Illegal alcohol

I

**IAPA:** Institute for the Attention and Prevention of Addictions  
(Instituto para la Atención y Prevención de las Adicciones)

**IARD:** International Alliance for Responsible Drinking

**ICAP:** International Center for Alcohol Policies

K

**kg:** Kilogram(s)

L

**l:** litre(s)

M

**m:** Mass

**Metabolisation of ethanol:** Process by means of which ethanol molecules are oxidised and become other compounds thanks to the action of the enzyme ADH, until they can be eliminated from the organism in form of carbon dioxide and water.

**Metanol:** Also known as wood alcohol or methyl alcohol. At room temperature it manifests as light (low density), colourless, inflammable and toxic liquid that is used as antifreeze, solvent and fuel. Its chemical formula is CH<sub>3</sub>OH.

**mg:** Milligram(s)

**mg/l:** Milligrams over litre

**ml:** Millilitre(s)

## N

**NIAAA:** National Institute on Alcohol Abuses and Alcoholism

**NOM:** Official Mexican Norm (Norma Oficial Mexicana)

## O

**OH:** Alcohol

**fl. oz.:** Liquid ounce. The British ounce is equal to 28.41ml

## P

**PAHO:** Pan American Health Organization

## S

**SD:** Standard Drink

## V

**v:** Volume

## W

**WHO:** World Health Organization

B

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