THE DYNAMIC AGEING SYSTEM OF
CRIADERAS Y SOLERA

1. Historic background
2. The system at work
3. The resulting average age
4. How to control the average age
5. Example

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- Since these early days, the solera system has also been applied

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WHAT IS IT?

The *Criaderas y Solera* method is a dynamic aging system, according to which the brandy progresses through different scales of maturation (called *criaderas*), each of them formed by a given number of barrels containing combinations of brandy of increasingly higher average age, until it reaches the last scale (called the *solera*), from which partial extractions of brandy are periodically made for bottling.

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THE FUNDAMENTALS OF THE SYSTEM

1. Total ageing stocks of brandy are classified in **different scales of maturation** (*criaderas*), each of them formed by groups of barrels with the same level of ageing. The last scale with oldest brandy is called *solera*.
2. Periodically, **partial extractions** (*sacas*) of equivalent volumes of brandy are made from each barrel in a given scale for its replenishment (*rocío*) in the barrels of the next scale (or for bottling, if the extraction is made from the last scale or *solera*).

3. In the case of the youngest scale, the partial replenishment is made with **new wine distillates** which in this way start the aging process.

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The number of scales in the system can be variable, generally 3 or 4, but often more.

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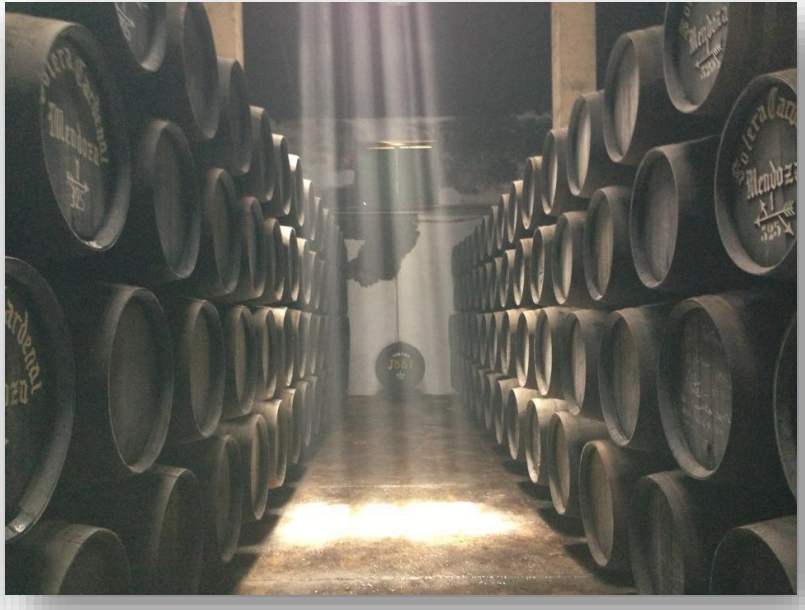

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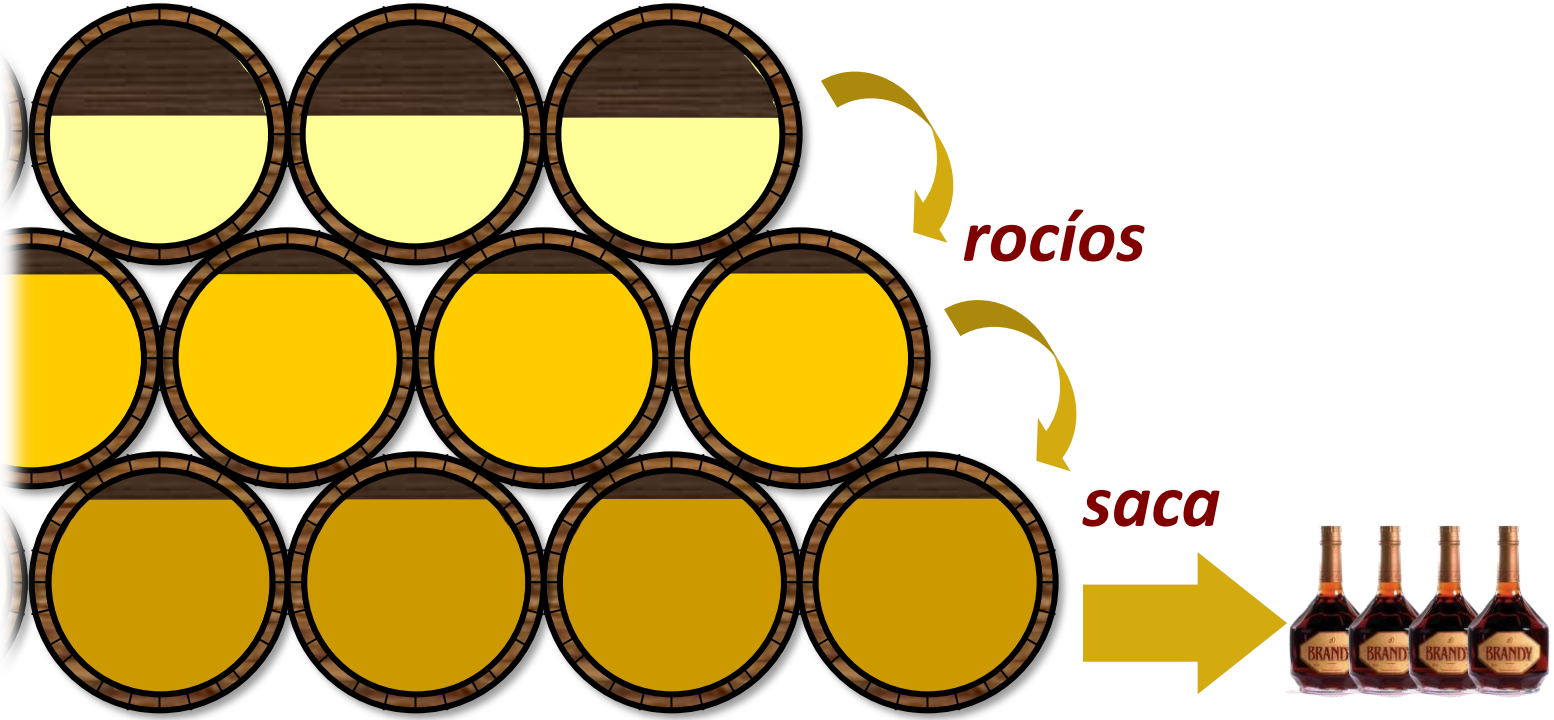

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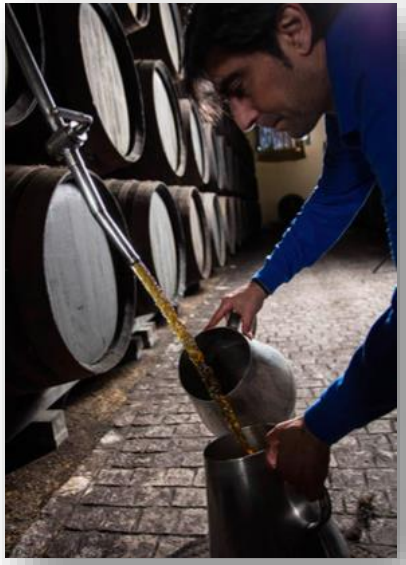
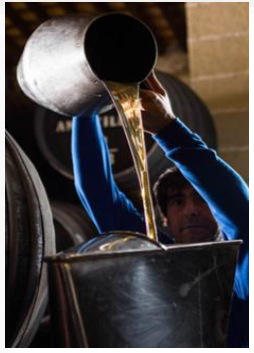
In small operations, *sacas* and *rocíos* (transfers of brandy between different scales) are made manually, using traditional tools.





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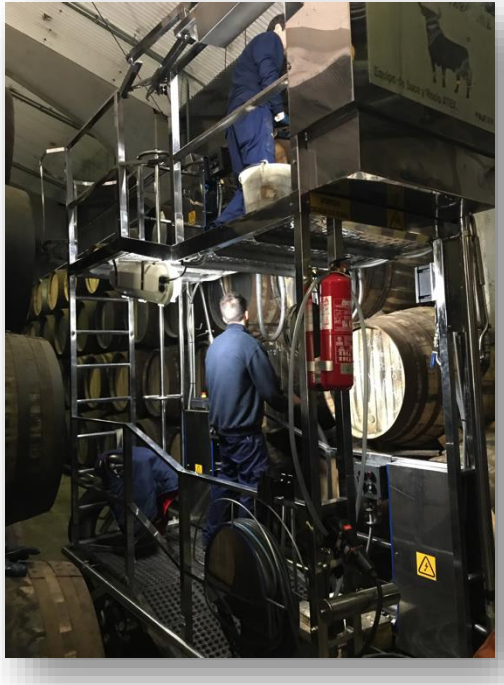
In larger companies, *ad hoc* machinery has been developed in order to automatize the process.



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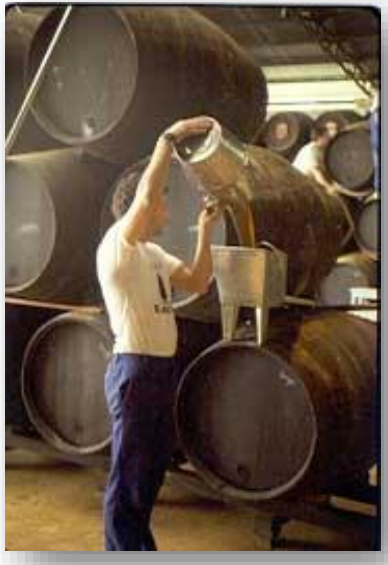
Either manual or mechanized, the system implies a labour intensive process.



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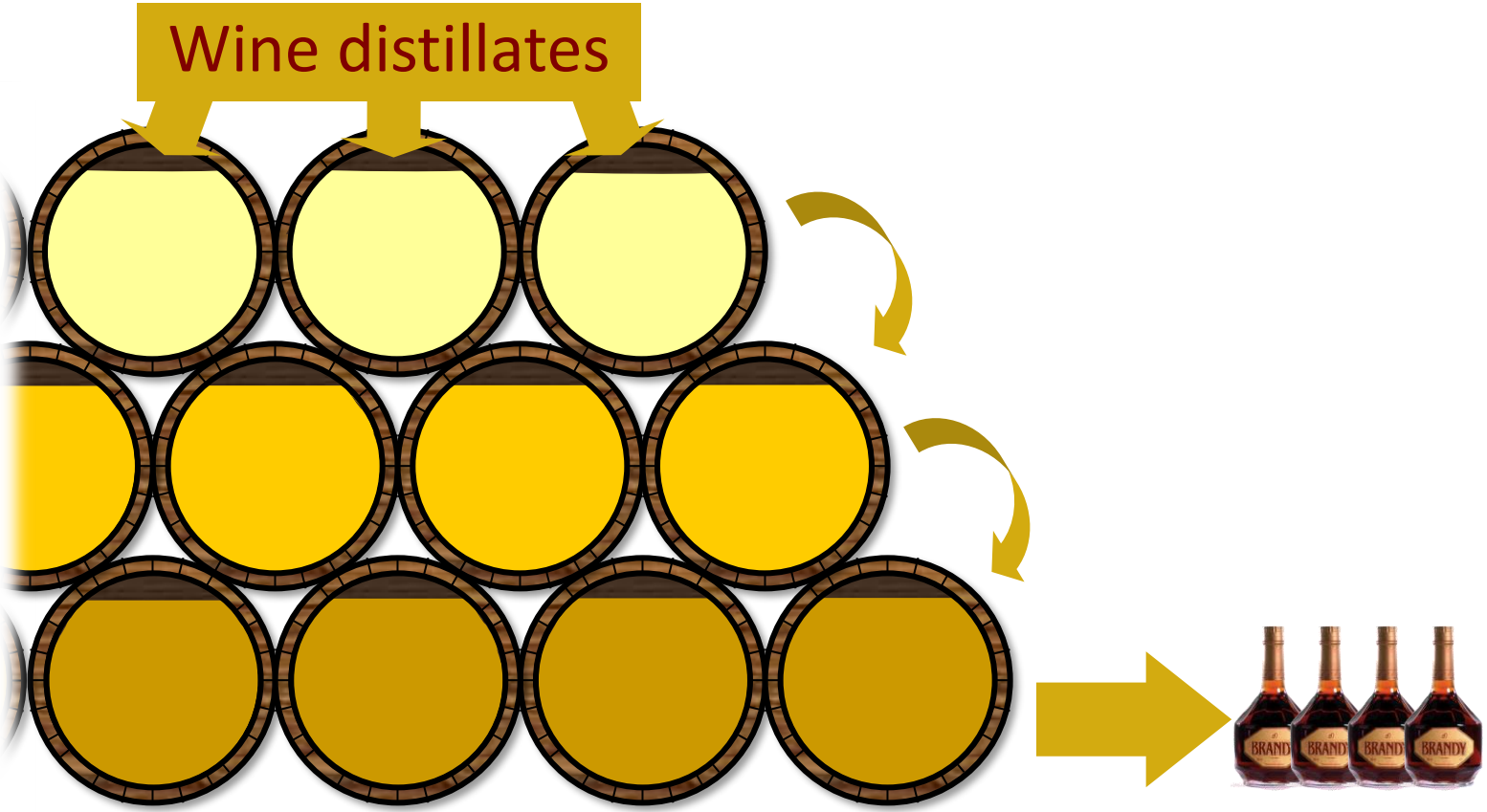

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THE RESULTING AVERAGE AGE

Previous considerations

- The Criaderas y Solera system is NOT a blending method, but first and foremost a DYNAMIC, CONTINUOUS AGEING SYSTEM for brandies.
- The system implies a continuous blending of brandies inside the barrels, as the aging process progresses through the different scales of maturation.

THE DYNAMIC AGEING SYSTEM OF CRIADERAS Y SOLERA

The average age of the brandy withdrawn from the *solera* depends of the following factors:

1. The total **number of scales** in the system.
2. The **fraction (%) of brandy extracted** for bottling from the *solera* barrels in every *saca* and replenished from the previous scales.
3. The **number of extractions** (*sacas*) and replenishments (*rocíos*) made in the system in a year.
4. The total number of **years since the system was established**

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The **average age** (t) of the brandy withdrawn from the *solera* can be calculated as follows:

$$t = \frac{N}{F*S}$$

As long as the system has been working for a minimum of t years

N - Number of scales.

F - Fraction (%) of brandy extracted from the *solera* barrels and replenished from previous scales.

S - Number of extractions (*sacas*) and replenishments (*rocíos*) made in a year.

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The previous formula is equivalent to the rotation of the total ageing stocks in the system, i.e., the division between the volume of all the scales in the system and the volume withdrawn in a year (*).

Assuming that all the scales in the system contain the same volume of brandy (V), as it is usually the case:

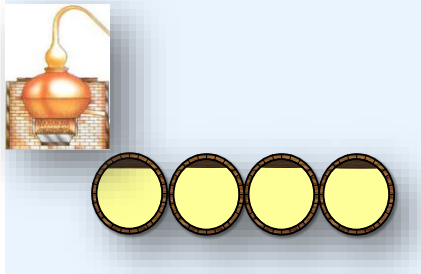
$$t = \frac{N}{F*S} \rightarrow t = \frac{N*V}{F*V*S} \rightarrow t = \frac{\text{TOTAL VOLUMEN IN THE SYSTEM}}{\text{VOLUME EXTRACTED IN A YEAR}}$$

(*) As long as the system has been working for a minimum of t years. See Example

EXAMPLE

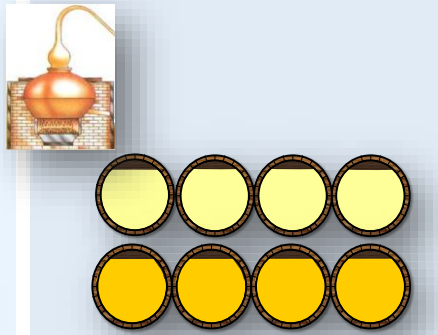
Building a *solera* system for a 3-year old (average) brandy with 4

Year 1



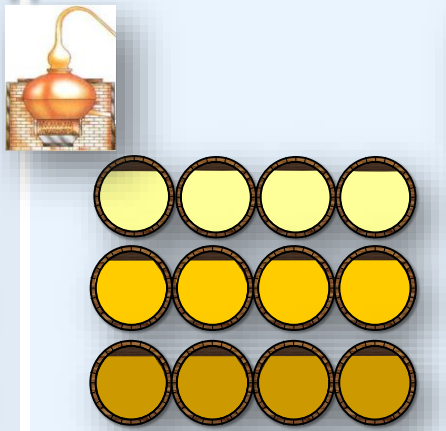
- First day in year 1. Barrels of future *solera* scale are replenished with wine distillates.
- No extractions of brandy (*sacas*) during the year.

Year 2



- First day in year 2. Barrels of future *1st criadera* are replenished with wine distillates.
- No extractions of brandy (*sacas*) during the year.

Year 3



- First day in year 3. Barrels of future *2nd criadera* are replenished with wine distillates.
- No extractions of brandy (*sacas*) during the year.

Year 4

- Procedures of the *solera* system start functioning, under the principle: $t = \frac{N}{F*S}$
- See plan of extractions & replenishments (*sacas* & *rocíos*) of year 4 (first year of

EXAMPLE

Analysis of *sacas* and *rocíos* as from year 4

1st Quarter

- First day Q1. An extraction of 25% is made from each barrel in the *solera* scale:

  100% 3 YO

- Replenishments of 25% are made from *1st criadera* into the *solera*, from *2nd criadera* into *1st criadera* and of new

2nd Quarter

- First day Q2. An extraction of 25% is made from each barrel in the *solera* scale:

  75% - 3,25 YO
  25% - 2,25 YO
  Average = 3 YO

- Replenishments as per Q1.

3rd Quarter

- First day Q3. An extraction of 25% is made from each barrel in the *solera* scale:

  56,25% - 3,5 YO
  37,50% - 2,5 YO
  6,25% - 1,5 YO
  Average = 3 YO

- Replenishments as per Q1.

4th Quarter

- First day Q4. An extraction of 25% is made from each barrel in the *solera* scale:

  42,2% - 3,75 YO
  42,2% - 2,75 YO
  14,0% - 1,75 YO
  1,6% - 0,75 YO
  Average = 3 YO

- Replenishments as per Q1.

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CONTROL OF THE AVERAGE AGE

In order to **guarantee de average age** of the brandy extracted from the *solera*, it is necessary a third-party control of:

1. **the total stocks in the system, and**
2. **the extractions made during the year.**

so that:

$$\frac{\text{Total stocks of brandy in the system}}{\text{Volume extracted during the year}} > t$$

Providing that the control has been in place for a