

Important facts about Rehydration & Direct Inoculation of wine yeast

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Winemakers have long utilised active dry yeast for its **long shelf life** and **quick preparation**.

However, as wineries seek to **optimise resources and time**, many are considering...

...direct inoculation
(bypassing the rehydration phase).

This approach has its own considerations, which are outlined on the second page.

Rehydration of active dry wine yeast:

Rehydration is the process of adding active dry yeast to warm water, transitioning the yeast from a dormant state to an active one, ready for fermentation.

Since yeasts are living organisms, any big change to their environment can damage their cell structure and cause them to die, thereby reducing the number of healthy, active cells in a population. Keeping healthy cells is particularly important at the start of fermentation when grape juice sugars are high and a strong healthy yeast population is necessary.

During the first initial minutes of rehydration, the yeast cell wall cannot differentiate what passes through the yeast cell thus allowing anything to enter. The advantage of using warm water is that there is nothing present that

is toxic to the yeast cell. Some of the compounds that naturally occur inside grape juice are toxic to the yeast (such as high concentrations of ethanol, SO₂, medium chain fatty acids, high levels of phenolic compounds and high levels of sugar). If the active dry yeast is rehydrated in warm water first, the yeast will selectively prevent these toxic compounds from passing through. This is due to the rehydrated yeast having a properly reconstituted cell wall that can regulate the compounds travelling across it.

If rehydration is not properly carried out, the cell can leak important cellular compounds (such as amino acids, nucleotides, enzymes, lipids and vitamins and minerals) through the membrane, which is extremely permeable at the time of rehydration.



Importantly - **adding dried yeast to cool water (15°C or 59°F or under) can decrease cell viability** by up to 60% due to clumping of yeast granules.

Overall **BENEFITS** of rehydration:

Properly following rehydration directions can lead to a **quicker, more vigorous start to fermentation and higher levels of sugar**, potentially saving time.

Important points for proper rehydration are:



- It is preferable to rehydrate yeast in water rather than in grape juice/must, to avoid harmful substances like SO₂ or pesticides.
- Use water volume 5-10 times the weight of the dry yeast.
- Rehydrate in warm water (35-40°C, 95-100°F), DO NOT GO ABOVE 43°C (109°F).
 - Do not add yeast to cold water and then heat up.
 - Add the yeast slowly and evenly to the water, not the reverse.
- Let the yeast sit for 15 minutes before stirring – DO NOT exceed 20 minutes in water in order to maintain cell activity.
- Cool the solution slowly before adding to must, ensuring a temperature difference no greater than 10°C (50°F). It is important not to add the yeast to cold must.
- The presence of foam or the lack of it does not reflect fermentation activity. Each yeast strain is different in this regard.

Inoculation of grape juice/must for fermenting **white wine**:

IMPORTANT! Don't add rehydrated yeast to grape juice/must below 15°C (59°F) to ensure a good fermentation.

Yeast can't handle large temperature shocks, and a sudden change of 10°C (50°F) or more can reduce fermentation rates and cause hydrogen sulphide accumulation.

To enable a short lag time and quick fermentation onset, ensure yeast cell density in the must is at least 5 million viable cells/ml. By following the manufacturers rehydration protocol this should be assured.



Inoculation of grape must for **red wine**:

Red wine grape juice/must contains indigenous yeast (including species of spoilage yeast) as these are present on the skins, pulp, seeds, and stems. The yeast population is directly related to the grape quality along with juice/must temperature, free SO₂ use and concentration, and pre-inoculation holding time.

Avoid adding rehydrated yeast at the same time as SO₂ as it can harm yeast viability.

Molecular SO₂ inactivates wild yeast or bacteria within minutes of addition to the must and becomes slowly bound to juice components over a period of hours. Several hours should be allowed between adding SO₂ and adding the yeast culture.

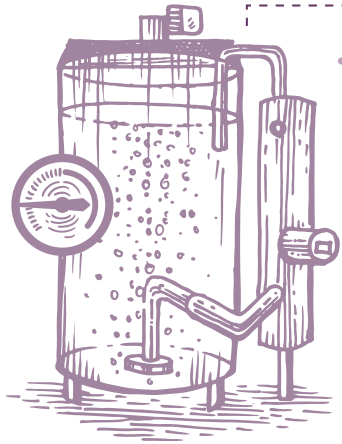
Inoculated juice/must should have at least 5 million viable yeast cells/ml. For poor quality grapes, use a higher yeast density.

If the crusher is chilled during fermenter filling, adjust the temperature above 15°C (59°F) before inoculating with reconstituted dried yeast, cooled to about 20°C (68°F). Ensure the culture is well mixed with the juice/must.



Direct inoculation/pitching:

Direct pitching of active dry yeast can **save winemakers some time, energy and water**, while offering **more convenience to cellar workers**.

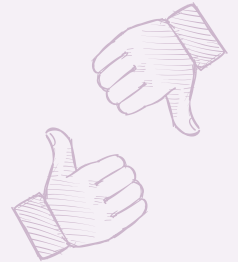


- Direct pitching makes sense for easy fermentation conditions such as:
 - good quality grape juice/must,
 - low potential alcohol levels,
 - high pH,
 - where temperature control is available,
 - adequate YAN present,
 - good nutrition or supplements are used,
 - optimal NTUs,
 - and good winery hygiene.
- It's a good option for less skilled workers as it reduces rehydration errors.
- Always use a higher yeast dosage for direct pitching.
- This method increases winery throughput.



Direct pitch protocol: white and rose wines:

- **Only add the active dry yeast after settling or juice clarification** - to prevent removing the yeast during these processes.
- Wait until the grape juice/must is above 15°C (59°F) before pitching.
- Sprinkle the yeast on top of the clarified juice.
- After about 15 minutes gently mix the tank by doing a slow pump over.
- **Prevent any violent agitation in the first pump over - at this stage the yeast cell walls are still fragile.**
- Alternatively direct pitch in barrels for barrel fermentation.
- Add yeast nutrition as normal.
- Adjust the yeast dosage to the potential ABV:
 - 30 g/hL for grape juice/must which will result in < 14% v/v.
 - 40 g/hL for grape juice/must which will result in > 14% v/v.



Direct pitch protocol: red wines:

- Directly inoculate at the top of the tank once filled.
- Wait till the grape juice is above 15°C (59°F) before pitching.
- Sprinkle the yeast on the liquid phase (at the start of fermentation) - **avoid adding the yeast onto dry skins.**
- After about 15 minutes gently mix the tank by doing a slow pump over.
- **Prevent any violent agitation in this first pump over - at this stage the yeast cell walls are still fragile.**
- Alternatively add after crusher/destemmer into the grape juice/must.
- Add yeast nutrition as normal.
- Adjust the yeast dosage to the potential ABV:
 - 20 g/hL for grape juice/must which will result in < 15% v/v.
 - 30 g/hL for grape juice/must which will result in > 15% v/v.



In summary: rehydration or direct inoculation

Each method has its considerations and pros & cons. Many of AB Biotek's active dry yeasts are suitable for both rehydration and direct inoculation in winemaking.

For any questions, reach out to your local AB Biotek technical support: wineinfo@abbiotek.com



Important facts about **Rehydration**

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