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# Winemaking in the 21st Century – How will consumer demands shape the future of wine?

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These days' winemakers all around the globe are experiencing many challenges and will do even more in the near future. The "art "of winemaking is more and more impacted by internal and external factors. Particularly the current economic situation and the rising costs in energy are adding to the already very stressful situation in the extremely competitive market. So, what are the most important topics the wine industry has to face?

## Global Wine Production and Consumption

The latest data presented by the OIV show that the total global wine consumption is declining and particular in countries where wine traditionally has been part of the daily life. Health reasons, wellness activities, driving issues etc. may count for the reduction.
New wine consuming countries i.e. the Scandinavian countries or countries in the East have not been able to make up for this loss.
At the same time we can already see a very strong increase in wine production which is not at its peak yet. New producing nations like India and China will send their products to the global market in the very near future. Countries like Brazil are increasing their production at high percentages. But also, it is very interesting to see that even countries in Europe which are located very much in the north (Netherlands, Denmark, Sweden…) are starting to produce wine because this seems to be very fashionable.
The international competition is growing dramatically. In order to gain or defend a place on the shelf a wine has to fulfil the increasing needs and demands of the consumers particularly when it comes to quality and price.
Here are two different "categories" of wines to find in the market. On the one hand customers, who can be called experts, are looking for site specific wines which show "Typicity" or "Terroir". This group is definitely in the minority but will grow in the next years. A fairly large group of wine drinkers wants more the "consumer tailored" wines which are produced in a certain, recognizable style and which are easy to understand.

The market demand for these two different categories of wines does impact modern production procedures very strongly. As a result in the last few years new technologies have popped up and have started to compete with older, more traditional methods. The global and often very emotional discussions around the world have had an extremely negative impact on consumers. The fairy tails of "Frankenstein Wines / Industrial Wines or Coca Cola wines" have been told everywhere (and mainly in Europe) and created not only a high confusion but also put wine in general in a difficult position. Many producing countries are now struggling on what to do: stay traditional or open up for new technologies.

Another important point is the global climate change. In the near future it will be more difficult in some well known wine growing areas of the world due to a lack of water and exposure to weather extremes but also due to a change of the must / wine composition such as high levels of alcohol.

So for example Germany has decided to allow new technologies for all wines with no Prädikat while for all wines with Prädikat (Kabinett, Spätlese, Auslese, BA, and TBA = high quality wines) only traditional techniques can be use.

This decision has two sides. On the one hand it protects the “traditional winemaking” but on the other side the question is raised whether traditional techniques are better, just because they are “traditional”?

In addition, we also notice an extremely increasing demand in the field of consumer protection which will get even stronger in the next years. Questions of allergens, residues, traceability, sustainability etc. need to be answered.

**How can we produce successful Wines in the Future?**

To keep up with the international competition and create the style of wine the consumer is looking for many wine producing countries see a chance by using new, alternative winemaking procedures. The list of possibilities is long and growing every day:

Concentration of must or Wine
Sugar Reduction in Must
Oak Flavour
Alcohol Adjustment
Removal of Volatile Acidity
Acid Adjustments
GMOs……

In many of the international discussions the use of these new technologies is seen very critical and very often boils down to the question of “agricultural” or “industrial” wines. While many New World wine countries for good reasons are using some of these new techniques the traditional European countries cannot due to the prohibition of some technologies by the EU law. This very often leads to problems and conflicts in the international trade, not to mention the unfair discrimination of certain wines.
A few years ago WTO has decided to reduce non-financial, technical trade barriers by harmonizing technical regulations and by implementing a mutual recognition agreement of all practices used within all member states.
The OIV (International Organisation for Vine and Wine) is the international body which has the competence to examine new techniques and add them to the catalogue of international oenological practices before they can be implemented into domestic legislations.
Unfortunately the EU has recently signed some bilateral agreements which completely ignore the role of the OIV and may lead to more difficulties in the future. This means that the EU does accept wines produced with technologies which are not legal in the EU from non EU countries. At the same time European producers have to obey to the much more restrictive EU law and this will certainly lead to more problems in the international arena.

In addition to all the legal issues we also have to deal with a factor, which has often been neglected in many countries => the modern consumer!
The evaluation of the consumer taste and the use of that information “to design” a product is a new but very strong approach to be successful in the market place. Sensory evaluation as a production and marketing tool has been known in many other areas but is still unfamiliar to the traditional wine producing countries. Again, the new world demonstrates that this method can be extremely helpful in gaining new markets.

**What do we have to expect from “Technology”**

Very often producers believe that the use of a new technology will solve all their problems and will help to produce the perfect wine. This opinion is getting stronger and stronger the more the producers have to deal with “problems” caused by the global warming situation. A few years ago it was impossible to discuss the technology of alcohol adjustment with European producers. Now this situation has changed.

So, what are the new techniques people talk about?

**a) Must Concentration**

This technology was introduced to create top wines with more mouth feel, body and alcohol. The discussions before the legal acceptance were highly emotional and had nothing to do with the scientific results but were linked to the "ethical" approach in winemaking.
Experiments from all around the world show the following results:

- From a sensory point there is no difference between must concentration and the use of sugar or must concentrate.
- Must concentration is very cost intense and results in more expensive products.

As long as the market is asking for deep red coloured wines this will remain an important technology in almost all wine producing countries.

**b) Wine Concentration**

The concentration of wine instead of must shows many advantages in terms of handling, timing, optimum percentage of water removal, microbiological stability etc... So far the sensory results are not very convincing and this technique is not legal yet within the EU and many other countries around the world.

**c) Oak Flavour by using Staves / Chips & Extracts**

The use of Chips instead of Barriques has conquered the wine world mostly due to the price but also to the earlier release of wines into the market and the easier handling. While many countries are successfully using Staves / Chips since decades, the EU has legalized this for European wines only two years ago. From a sensory point of view the use of Staves / Chips or Barriques cannot be distinguished or statistically proven.
Concerns about an aromatisation of wine or residues coming from Chips could be eliminated by comparing analytical results of wines treated both ways.
In 2004 the OIV accepted a resolution on the "Definition of Chips" which was mostly dealing with the size of Chips. 95% of the used amount of Chips has to be removed by using a screen with a pore size of 2mm.
This size was agreed on to avoid the use of extracts and please note the use of oenological Tannins with wood flavour is also prohibited.

The EU conducted a market research a few years ago to find out what the consumer thinks about the use of chips. The result was very surprising as more than 80% of all people asked had no problem with this as long as human health was not impacted and the price of the wine was acceptable.

**d) GMOs**

This is certainly one of the most sensitive issues and will require a lot of attention and precaution before a possible introduction into the market. All advantages as well as disadvantages have to be evaluated very strictly. Particularly the impact on the environment has to be under close investigation.

**Current Problems and Discussions**

All the new technologies used in winemaking around the world work very well from a technical view. Still, some technologies work by splitting must or wine into fractions in order

to work more “gentle”. These fractions have a different analytical composition compared to the base product. The question we are facing now is: “What is a fraction of wine”?
The answer is very difficult to find. If a fraction of wine is the same as wine, then the aromatisation of wine can be legalized! And Ladies & gentleman this is not what we want.

If a fraction of wine is not wine, then we have to see what law is in place? Can we split a wine into fractions, do a treatment and still call it wine after the recombination of all the components? Do we need a new definition of “wine”?
These questions have to be answered before some of the new technologies can be accepted!

At the OIV level there are some very interesting technologies in the pipeline waiting for approval:

**a) Alcohol Adjustment in high Alcohol Wines**

This technology is widely and successfully used in the New Wine World for top wines as well as for medium priced wines (Tax reasons). Products with alcohol levels above 13 or 14 % vol. are taken to moderate alcohol levels around 12 % vol. for quality reasons and a better consumer response.
Due to global warming reasons now European producers are also experiencing more and more problems with high alcohol levels in their products and would like to be able to reduce this alcohol. Unfortunately the reduction of alcohol except of the production of alcohol free wines is still strictly prohibited in the EU. Following certain bilateral agreements wines produced this way are allowed to be sold in the EU.

**b) Removal of Volatile Acidity**

Rainy vintages or sluggish/stuck fermentations can easily lead to wines with elevated levels of volatile acidity. Particularly wines which will go into barrels might suffer from a sweet and sour impression. Products which are still within the legal limits of VA can be treated to improve the quality. Wines which have additional sensory defects cannot be positively manipulated. So far, the treatment is handicapped by its costs.

**c) Acidification by using Physical Treatments**

Many warm climate regions have the option to increase the acidity by adding one or more acids in order to establish better microbiological conditions and create a better taste.
A new approach is not to add acid but do a “self-enrichment” by removing ions with the help of Ion-Exchange-Columns or Electro-Dialysis-Units. The advantage would be that no component originated from wine will come into the product.

**d) Sugar reduction in Must**

By using a combination of different membranes natural sugar levels in must such as Glucose and Fructose can be diminished and undesired high alcohol levels can be avoided. Problematic fermentations due to too much sugar in the fermenting product can be reduced. This technology takes a proactive approach by dealing with the problem already in the must and not in the wine.

**Critical Question: Are traditional Technologies better because they are “traditional”?**

Very often traditional producers but also consumers believe that traditional technologies are better because they are old, well known, well established etc... But is this really true?

A few years ago the OIV accepted a resolution on the definition on Ice Wine to avoid fraud and to protect a special product with its old, traditional production process. By looking at the text it is easy to see that there are many obstacles to overcome each year to make such a product. From a marketing point of view this might make no sense because the steady supply is in danger. But on the other side products which are difficult to produce can be offered as rare and therefore get a better reputation and price.
As a result Cryo-concentration as one method of must or wine concentration is not permitted for the production of Ice Wine.

Therefore in my opinion each new technology should be seen and examined individually in order to see advantages or problems. But at the same time existing, traditional methods also should be revisited to evaluate their existence in winemaking and constantly to look for better options.

**Future Trends**

Current international discussions show the major concerns and are mainly dealing with the issues of:

**a) Sustainable Production**

In this field we see a demand for the reduction of treatment in the vineyards as well as during the winemaking process in order to protect the environment and to produce wines that respect the expectations of the modern consumer. This might be reached by planting more resistant varieties and maybe the use of more time in the cellar.

Also, the use of physical technologies could be favourable.

In this area the South African Wine Industry with its IPW program can certainly take on a leading role in the world.

**b) Traceability**

Every consumer has the right to be informed (on demand), with what material the wine has been in contact such as fining material, hoses, pipes, whatever equipment…. This allows to judge whether the wine can be consumed by people with allergies, vegetarians etc. and to deal with the problem of residues.

**c) Residues**

In times of increasing efforts towards consumer protection, the health of consumers such as allergies but also the environment is in the centre of attention. It might lead to a wider use of physical treatments and even “ban” of some traditional technologies such as certain finings.

**Final Remark**

Winemaking will be facing many new challenges in the near future particularly in:

- A higher consumer demand in quality
- More competition in the global market
- Global Climate Change
- Additional benefits like: Health issues / Wellness / Pleasure

Due to the increasing global competition in the market we will see many new strategies to promote and sell wines. Interesting stories around the wine and its production will be told to convince the potential buyer. Production techniques, residues, impact on the environment will be just some of the factors to focus on.
At the same time we experience that the “battle” for shelve space, moved from the Economy to the Oenology section!

But the decision will be made by the consumer. By buying the products they prefer for whatever reason they will tell the producer what path they should follow in making their wines!

I think that we as researchers, winemaker and producers have the mutual responsibility to protect wine and its heritage as a natural product. That does not mean that we should only focus on the traditional methods. It is absolutely necessary to investigate new technologies and when they are beneficial, also introduce them to the wine industry and in doing so, ensure a positive future!

Technologies which are now considered to be traditional once were also new and critically looked at, but the past is the beginning of our future!