

Brewery Rodenbach: Brewing Sour Ales

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Brewery RODENBACH, Belgium
brewing Sour Ales

Brewery Rodenbach is a brewery who specialized during his 160 years of existing in brewing specialty beers and only specialty beers. All of them are brown sour ales. Michael Jackson classifies them as the Red Ales of Flanders, although this is a name that isn't in use in Belgium it self. In Belgium those beers are rather classified as brown-sour ales. Rodenbach had a market share in 1994 of 90% of these beers. A brewer can only dream of this ! But the whole market of this beer was only around 110.000 Hl. In the US, such brewery should be a regional brewer.

What is special about the Rodenbach brewery is mainly the fermentation and more particular the third fermentation that takes place in huge oaken barrels for up to two years I The process of making and selling the Rodenbach beers will be discussed in the following text.

1. Raw Materials

The brewing water is gained in a restricted park area, the backyards of the Rodenbach castle. In this beautiful park, some wells are collected in an artificial lake. This water is adjusted to brewing water. The adjustments of the water mainly consist out: disinfection, filtering over sand and active carbon, ion exchange and an atmospherical degasser. Calciumhydroxyde is added as the last treatment to remove temporary hardness

The brewery had his own malting plant, which stopped in 1974. Beautiful parts of this floor malt-house can still be visited, for example the old germinating floors. The old kiln (1864) certainly is most special. The kiln tower would have been broken down, if English students wouldn't have been interested in it. It seemed to be the only still existing kiln typical for the northern England region. So better than reconstructing the kiln in England, the Rodenbach brewery started to restore the tower herself.

Wondering how this type of kiln was found in Roeselare brought Rodenbach back to a member of the family: Eugene Rodenbach. Eugene learned the job of brewer around 1860 in northern England. Returning to Rodenbach he copied two things he had seen: the kiln construction, but still more important is the way of making beer. During the time he was in England, a pub could buy fresh beer in a brewery. But there were traders who kept the beer for some years stored, and sold it for the double of the price. Visitors to a pub could drink the young or the old ale, or ask the bartender to blend both in a certain amount. The consumer paid respectively 2, 4 or 3 pence. (Wheeler G, 1993)

Brewers never have been so stupid and saw that there was a lot more to gain when they stored their ales themselves, or even better, blend it their selves. These should be the real roots of Porter beer in England. And this was what Eugene Rodenbach saw happening when he looked around in these English breweries.

So it isn't alone the kiln, who is the only remainder of his type. Maybe much more important than that is that Rodenbach should be the remainder of the roots of the English Porter ! Worthwhile mentioning here is the Green King brewery in Bury-St-Edmonds, England. This brewery still uses these large upstanding oaken barrels for blending beer. Green King has still two barrels, covered with marl, where a strong alcoholic ale age, without acid formation. The classic Rodenbach is really the beer of this blending Porter process More about that blending later on, in the third fermentation or= aging.

Three kinds of malt are used to make the Rodenbach beers. All of them are colour malts. Two are very slightly heated in a kiln, while one is shortly roasted in a drum. Different mixtures of this malts are used to make the two kinds of brews.

As starch adjunct corngrits is used in amounts around 10-12% for economical and taste aspects. Beer brewed with some starch adjunct gives

a lighter, more digestible beer Almost all Belgian beers use some corngrits or rice.

The hops used for Rodenbach are Belgian bitter hops. Belgium isn't a big hop producing country, but the main hop area, Poperinge, isn't so far...Rodenbach, being a sour beer, doesn't need a lot of bitterness: 14-16 EBU. Varieties of Northern Brewer, Brewers Gold, Target and Yeoman are used.

A first thing in being special is that Rodenbach doesn't use a single culture yeast. The yeast added to the Rodenbach wort is a collection of yeasts. This collection of yeasts is kept "infected" with a whole range of lactobacilli.

Such a collection of yeasts and lactobacilli is difficult to maintain. A stock culture of such a mixture would already be a selection. The only thing Rodenbach can do is to reuse this mixture over and over again. The only way Rodenbach has to keep the yeast "pure" is selection and washing. Selection starts by following the fermenting wort, to decide which yeast is going to be collected and in which amount. Washing yeast is a strong acidification of the yeast shortly before adding it to new wort. With this washing, a correction can be made in the number of lactobacilli compared to the number of viable yeasts. In Rodenbach we are talking about lactobacilli percentages You even can't wish this to a fellow brewer !

To keep the yeast in a good condition, you have to brew enough This is a difficulty for smaller brewers, who are trying to brew a Rodenbach like beers. To make sure that beers are good, Rodenbach provides yeast to these brewers, for every brew they make.

2.The Rodenbach process.

The brewhouse dates back to 1920. This is remarkable because many breweries had to stop during the second world war because of the German need for copper. Rodenbach was one of the breweries who could continue brewing, because soldiers had to be fed. The wartime beer wasn't that

much because of the lack of raw material. Older brewers tell stories of Belgian brewers who came to Rodenbach to drink beer brewed before the war, with the usual raw materials. Thanks to the large stock of beers in oaken barrels Belgian brewers could survive the war. It was easy to mislead the Germans in this labyrinth of barrels.

Brewing isn't so special. Two kinds of brews are made: an 11° Plato and a 13.5° Plato wort. There is little difference in the way of brewing and fermenting, only the recipe for the malts and corn is slightly different. A brew starts with corngrits that is cooked up in a cereal cooker with some milled malt to provide the enzymes. Meanwhile the mash is started at 50°C (122°F) and heated to 63°C (145°F) and 72°C (162°F) with the cooked corn and a steam jacket (something between decoction and infusion method). The mash is filtered in a classical lautertun and cooked during 1h30 with hop addition. Until 1992 a large coolship was used, but better trub separation and less infection risk are now reached with a centrifuge and heat exchanger. The wort is cooled to 17°C (63°F) and aerated with sterile air. One brew is 250 to 280 Hl. Every four hours a brew can be started.

The first or main fermentation is done in cilindro-conical fermenters since the beginning of 1995. Before this period, fermentation took place in 110 Hl flat-bottom rectangle tanks. Changing over to large cilindro-conical fermenters is a difficulty for every brewer due to the changing ester formation. But for Rodenbach the even more difficult part was the behaviour of our mixed culture, more specified, the lactobacilli.

Three brews are collected in one fermenter within 10 hours. The mixed Rodenbach yeast culture is added. Temperature rises to 21.5°C (71°F) and is then held constant by cooling. When 75% of the apparent extract is fermented, the beer is cooled to 15°C (59°F). Yeast settles down and is collected before beer is transferred to the lagering or second fermentation.

The second fermentation or lagering is continued at an ambient temperature of 15°C (59°F) in epoxy coated metal vessels. The 11° Plato beer is held for 4-5 weeks in horizontal tanks. The 13.5°

Plato

beer stays a bit longer in vertical tanks: 7-8 weeks. Most of the ale type of yeasts settle down. The aim of this warm lagering is to give the lactobacilli some time to softly acidify the wort by producing lactic acid.

Only the 13.5=BO Plato wort is transferred after the lagering to oaken= barrels for an aging of two years. During these two years the beers change a lot. The huge ageing cellars are the soul of Rodenbach. 294 vessels with a volume of 100 up to 660 Hl are spread in 9 cellars. Every beer that has "Rodenbach" in his name contains at least partly (classic Rodenbach) or 100% (Rodenbach Grand Cru and Alexander Rodenbach) beer out of these cellars.

The main thing that happens within this aging periode is further acidification of the beer, and that in two ways: aerobic and anaerobic. Lactobacilli continue on an anaerobic manner in the inner part of the vessel. The lactobacilli seem to be more sensitive for ethanol formation and their own lactic acid. Within 12-16 months lactic acid formation seems to stop. This period is variable from vessel to vessel, and doesn't seem to be constant for one vessel during repeated fermentations. On the other hand oxygen is provided by diffusion through the oak. This is the main reason for using oaken barrels. A whole range of micro organisms can live thanks to this oxygen supply. This micro organisms lives in the beer near the walls or even more likely in the wood itself. They don't seem to be inhibited by acid formation and are difficult to monitor.

The formation of the different components by these micro organisms, lead to derivate formation of components such as esters. The two most important ester that are found are ethyl lactate and ethyl acetate, the ester formation of the two acids and the alcohol that are present in the highest concentrations. These esters are very important for the final taste pattern of the Rodenbach beers. For more details I refer to the study who has been made on Rodenbach beers (Martens H, 1996).

In the oaken aging vessels, yeast can also be found. The yeast cells continue to live in the beer, and they still can produce a

considerable amount of alcohol. The ale type of yeast slowly disappears during lagering, but different Brettanomyces (mainly lambicus and bruxellensis, but several others) yeast cells starts to grow. Brettanomyces is a very slow developing yeast, that is mainly known due to the geuze.

A lot is happening in Rodenbach's large oaken barrels. But as a practical brewer, Rodenbach doesn't has many impact on the process. Tasting and pH control from time to time is the most important things. Control of temperature and time are to parametres to keep an eye on. Inspection of an empty vessel is important, and sometimes beer is transferred from one vessel to another, partly or the whole of it. The inspection of an empty vessel leads to decision on the maintenance of it.

3.maintenance of the oaken barrel

There are three kinds of maintenance on the barrels. Rodenbach has still three coopers, who have to learn the job within the brewery (where else ?). One of the coopers has to make a daily tour and has a look to all the barrels. Mainly in periods with temperature differences, leakages can happen. Small leakages are treated with cotton wire to be pressed between two staves. Bee-wax is being put on it afterwards. More difficult and larger leakages are stopped by hammering the rings of the barrels down. The barrels are slightly conical and pressure on the staves can be increased by doing so. It happens that a leakage can't be stopped. Then the barrel is emptied and it will be broken down as discribed further on.=20

Beer stone forms at the inner side of the oak barrel. It is only partly the beer stone (Calcium-oxalate) as brewers see in their tanks. This beer stone can lead to a partial or total blocking of the oxygen diffusion. So on an average of two filling times, decided by visual inspection, the inner surface of the barrel is scraped. The vessel is cleaned and sulfur is burned in it. For refilling the barrel, 10% of beer of two years old is added as an inoculum, to restart the vessel.

Approximately every 20 years a barrel is, stave by stave, complete taken into pieces. All of them are transported to the cooperage. The staves are shaved at all sides, taking into account the round shape of the

barrel. The inner side is shaved concave, the outer side convex. While all the sides are shaved, the total diameter of the oaken barrel gets smaller, so mostly one new stave has to be made. Sometimes it happens the diameter of the rings is reduced by replacing the clinch-bolt.

The barrel is reconstructed without one nail, only pinhole constructions are used. Between the staves, the coopers place new rush or reed. A difficult thing is hanging the ceiling of the reconstructed barrel. The ceiling has to fit within a spared place in the staves. This whole process takes an average of three weeks.

Now the barrel has to be refilled. Therefore, the barrel is first filled with water. The wood and the rush swells and makes the barrel watertight. This can last for weeks. Then, the barrel has to be refilled. This happens just like the end of the second level of maintenance: cleaning, sulfur burning, 10% old beer and finally refilling. This barrel can contain Rodenbach again for some 20 years.

4. The three Rodenbach beers

The tricky thing about Rodenbach is making three beers out of two worts. The 11=B0 Plato wort isn't even sold as such, but only used for blending. The 13.5=B0 Plato wort, that passes over the oaken barrels is used for all three the beers ! The oaken barrels are the soul of Rodenbach. The soul is to be found in every beer !

The Rodenbach Grand Cru is the easiest story. After an average of 20 months the beers from the oaken barrels are tasted by our tasting panel. The times of tasting can be earlier or later. It all depends on the size and wall thickness of the barrel. Smaller barrels have relatively more surface compared to the contents. So the ageing goes faster, the 100 Hl barrels are tasted after 16 months. Until now, these smaller vessels were not chosen for Rodenbach Grand Cru or Alexander Rodenbach. A faster aging, by thinner wood or smaller vessels doesn't seem to be appreciated by our tasting panel. The thicker the wood, the slower the oxygen diffusion happens, so the slower the ageing. The thickness of the wood can be up to 7-8 cm.

The tasting panel has to choose one vessel out of all the vessels that are ready. Rodenbach has 294 barrels, what means that there are 294 beers. When a barrel is chosen for Rodenbach Grand Cru, then 120 Hl is taken from that barrel and cooled to 1=B0C. The beer is then stored cool for at least a= week. The final clarification is done only by a centrifuge to bright beer. We have to add CO2 to the beer because we can't keep pressure on an oaken barrel. The beer is then ready for bottling.

The second beer is Alexander Rodenbach. Alexander Rodenbach was the founder of the brewery. In 1821 he bought a small existing brewery from a certain sir David. There isn't known more about the history of this brewery before that date. 15 years later Alexander and his brother Pedro start a corporation: the brewery Rodenbach. It is therefore that 1836 is considered as the founding date of the brewery. (De Bruyne, 1986)

This Alexander Rodenbach was a very remarkable person. He got blind at the age of 11. He started a school for blinds in the Netherlands, owned a brewery and a distillery, was mayor and a member of parliament for 37 years, from the beginning of the Belgian parliament, with the independence of Belgium in 1830. But he didn't had any children. Still, the owners of the brewery are the ancestors of Pedro Rodenbach.

The new beer, Alexander Rodenbach, was created for the 150th anniversary of the brewery and was named after this remarkable person. The beer is also for 100 % old beer with a slightly different taste pattern. Again 120 Hl beer is cooled to 1=B0C and placed on a tank with cherries. At least a week later= the beer is clarified for the first time with a centrifuge. The beer is then kept again for one week with sugar before the final clarification. The beer has the same pH as Rodenbach Grand Cru, but has a sweet-sour taste, with the flavour of the cherries.

The classic Rodenbach is drunk in a higher amount in the brewery region and at the Belgian coast. In summer sales triple because of the very thirst quenching properties. The taste is much better known, so taste difference may not be so big for that beer. Although we have to start with the old beer, where there are as much differences as Rodenbach has barrels.

Therefore the old beer is first blended with other old beer as decided on tasting. Then this beer is blended, just before cooling, in a ratio of 30% old beer. The rest of the beer is the young or the 11=B0 Plato beer. Again, the beer is kept cold for a week and then clarified. This beer is then ready for bottling.

5.Selling Sour Beer

Beer isn't sour. People don't recognise sour beers as beer. That is why we get even phone calls from people living 40 kilometre far from the brewery Rodenbach. The best thing we can do is invite these people to the brewery to show them that being sour is normal for a Rodenbach. For Belgian people, who are used to a very rich beer culture and a wide variety of beers tastes, it is easier to accept a sour beer. The Rodenbach brewery mainly produces for the nearby region. Around the brewery, the classic Rodenbach is drunk as a pils is drunk in other regions.

The brewery is producing only sour ales. Therefore Rodenbach is very fashion dependent. When Belgian people turn over on sour beer, Rodenbach has difficulties to follow the demand. We see that on that moment a lot of ersatz beers come on the market. While on moments where these type of beers aren't fashionable, they disappear and go in a latent phase. Rodenbach has survived fashion by producing constantly the same beer type.

But a quite recent development is that Rodenbach, and other Belgian breweries are asked to deliver their beer in a much wider region. The rich Belgian beer culture was Belgium's best kept secret. Brewers see a world wide growing interest in beers, with maybe 99% pilseners in volume. Other countries develop an interest in specialty beers. Doing so, they have to arrive in Belgium. But within this wide variety of beers produced in Belgium, there are some types difficult to copy. Rodenbach certainly is such a kind of beer. So Rodenbach started to export because there was a demand.

Japan is now the country abroad Belgium where we sell the most Alexander Rodenbach. We also see a rising interest in the US. In the US, we remark a special interest for Rodenbach Grand Cru, after a hesitating start with the classic Rodenbach.

4. Conclusion

Personally, I think the most interesting part of Rodenbach is the way the brewery continues. A way that is special. This gives a unique beer that seems to be appreciated worldwide. Rodenbach tries to give a surplus to the richness of the Belgian beer culture. Try to give your brewery its own surplus and you'll be rewarded for it. For brewery Rodenbach

Bouckaert Peter

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