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Business plan for a craft brewery

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The main objective of the thesis was to plan a start-up business for brewing beer. In order to create a business plan in the theoretical part we considered the following aspects: economical environment, marketing, financial statements, management and manpower, alcohol production and consumption in Finland, equipment and brewing process, recipe development.

The empirical part represents our business plan for a craft brewery producing beer of various styles and selling it in the city of Helsinki. In the course of work on it we conducted a survey among the residents and visitors of Helsinki, analysed the results and developed beer recipes based on the results of this analysis. We also undertook a competitor analysis and found out who our direct competitors are, as well as, prepared SWOT analysis thereon. Financial statements are included into the business plan in order to prove feasibility of the business.

We achieved the objectives of the thesis as we planned a start-up business for brewing beer and selling it in in the city of Helsinki, researched cost to sales revenue ratio and effective production rate, found a niche for the business in the local market, created excellent beer recipes and worked out the product development strategy.

Keywords
Business plan, beer, recipes, brewing

Table of contents

1 Introduction

Craft beer concurred European market not long ago. Although local breweries and their product become more and more popular among big city dwellers.

> The interest which many consumers have for the diversity and variety of Europe's beers has also probably never been higher, and this has led to more than 1,000 new breweries opening in 2014 (Carceller 2015, 4).

The trend has been developed so well that big fine dining restaurant chains and super markets purchase and retail craft beer.

There is a certain competition in the Finnish beer market that is to be researched in this work. We are aiming to analyse it and create a product oriented thesis on the topic. The fact is that brewing beer does not necessarily require big investments depending on the technologies and beer variety a brewer chooses. In Finland the biggest craft beer breweries produce mostly IPA and APA due to the lower production cost. Therefore, there is room in the market if we consider other beer varieties.

The first objective of the thesis is to plan a start-up business for brewing beer and selling it in the city of Helsinki. Business planning includes market analysis, business idea, product and recipe development, financial reporting, HR management, craft beer production strategies. The topic of the thesis is relevant due to high demand of beer among Finnish citizens and relatively low expenses for its production.

The second objective of the thesis is to research cost to sales revenue ratio and effective production rate, to find a niche for the business in the local market, to create excellent beer recipes and to work out the product development strategy. It is also significant to consider the legal part of the business as it has to comply with the Finnish legislation.

We find the topic relevant and useful for our future career. At some stage of life we are going to establish a small-scale brewery and supply craft beer to the stores and beer restaurants of Helsinki.

2 Business planning

Both large and small businesses may face uncertainties at different stages of growth. The difference is that former are more likely to have "internal" uncertainties while the latter face "external" ones. (Storey, Greene 2010, 2-3.) Paul Barrow in his book "The best-laid business plans" recommends to make mistakes on paper prior to getting on with it for real. Cranfield University conducted a study in 1990 which showed how business planning may affect companies' success. 75% of them did not have any business plan in their first year of existence. 40 % of these companies failed. The same study revealed that 95% of businesses which had been trading more than 5 years had a business plan. Only 5 % of the group failed within this period. (Branson 2001, 10-11.) The statistics show that business planning does not guarantee businesses 100 % success. However, it increases chances for survival and success.

> A business plan is a written document that describes in detail how a business, usually a new one, is going to achieve its goals. A business plan lays out a written plan from a marketing, financial and operational viewpoint. (Investopedia)

Writing a business plan for our start-up company we are aiming to create an action model for its development. Timothy S. Hatten suggests three purposes of a business plan which are proving feasibility, attracting capital and providing direction. By planning we are forced to look critically at our means, goals and expectations. We also need to prove the bankers we have a solid idea, which can be represented in the business plan, to raise any significant capital. Moreover, a plan is a road map for future operations. Using it we are more likely to stay on course. (Hatten 2006, 103-104.)

2.1 Economical environment

Small businesses make a valuable contribution into the economies of European countries, even though they are also formed by large businesses. According to the European Commission small and medium-sized enterprises ensure economic growth, innovation, job creation and social integration in the EU. They represent 99% of all enterprises and employ an increasing number of persons. (Eurostat 2015.) Small and large businesses are interdependent due to symbiotic relationship that exists between them.

> Multinational corporations and small businesses depend increasingly on one another for innovation, supply needs and financial and technical mentorship, and federal policies should better reflect and promote those symbiotic relationships. (Harrison 2012)

J.D. Harrison provides the results of the research with the Business Roundtable in 2010 as an example. It shows that the average American corporation purchases $ 3.27 billion worth of goods and services from more than 6000 American small businesses. (Harrison 2012.)

Small and medium-sized enterprises may vary in size depending on different criteria and industries. Timothy S. Hatten states that among the most common criteria there is number of employees, sales revenue, the total value of assets, the value of owners' equity (Hatten 2006, 4). In the low-technology manufacturing industry small enterprises account for at least 50 employees with turnover of 10 million euros, micro-sized companies employ 10 persons or more and have turnover of 2 million euros. Large enterprises can account for a sizable portion of a country's economic output. Therefore, if global demand even for one product falls, a country can face severe consequences that show in the aggregated measures of economic activity. This has been the case for example in Finland. (Eurostat 2015.)

In our business plan we are aiming to find out what types of enterprises become our competitors and in what economic environment we are going to grow our business. In Finland gross value added share of large enterprises is 60% and persons employed share is 50%. These indices are the highest among such European countries as Denmark, Germany, Norway and Latvia. (Eurostat 2015.) A significant part of the economy is constituted by large enterprises. It means competition between small, medium-sized and micro business is even tougher.

2.2 Marketing

Prior to the stage of product development we need to go through the marketing process due to the customer-driven philosophy of our business. According to Beloglu, Bowen, Kotler and Makens (2017, 30) the marketing process consists of a number of steps which companies should take by researching consumers' needs and wants, creating value for customers and building strong customer relationships. Managers need to know their customer's profile, needs, wants and expectations while working out their marketing strategy. As believed by Hatten (2006, 306) it is what the marketing efforts of a business are intended to accomplish and

how the business will achieve its goals. Identifying marketing strategies will help us to be proactive and represent our business drivers to the potential investors.

> Customer-oriented firms channel information quickly to various functional areas of the organisation (sales, marketing, production, finance etc.) and thereby strengthen firms' ability to interact more effectively with their customers (Kuada 2008, 19).

The process mentioned by Kuada becomes more and more relevant in the modern world since customers interact and exchange their opinions in social media and through other channels. Blazevic, Hammedi, Garnefeld, Rust, Keiningham, Andreassen, Donthu and Carl in their article "Beyond traditional world-of-mouth" (2013, 294-295) assume that customers' influence on each other opinion threatens established firm-customer communication channels. Therefore, companies need to analyse the process of customer-driven influence. Studying this phenomenon is necessary due to three developments which are variety of methods of connection and sharing data among consumers, large amount of information available for customers to check before they make a decision and other environmental stimuli influencing decision making process.

Customer driven marketing management is based on marketing analysis, which provides companies with an insight to customers' needs and expectations. The more complex the operational environment is the more crucial market information is for successful business operations. Therefore, companies need to gather data on strategies the competitors pursue in given markets. Market opportunity analysis consists of 5 elements which are demand, segmentation, industry, competitor and channel analyses (Kuada 2008, 82). Further in the chapter we are studying segmentation, demand, competitor analyses and the aspects related to them.

2.2.1 Demand analysis

Market demand for a product or service is the volume that would be purchased by a certain consumer group in a certain geographic area in a certain time period in a certain marketing environment under defined marketing efforts (Beloglu, Bowen, Kotler & Makens 2017, 588). There are 3 types of market demand.

- Incipient market demand represents a future market. It can take place in a country, which has a demand for some product but does not have monetary resources to develop and launch it. Therefore, it becomes a project for the future.
- Latent market demand is existing already, but there is no offer coming from the companies. One of the reasons for it is the fact that they are not aware of such a demand yet.
- Existing market demand represents current market. Customers are willing to pay for the products offered by the companies. (Kuada 2008, 84-85.)

Companies focus more on the third type due to product standardisation and globalisation. However, if they aim to develop their products and services the first two demand types can also be taken into consideration. Penetrating new markets companies might have problems while selecting better sales territories and allocating their marketing budget among those territories. Depending on the size of the business they need to analyse the market potential of the cities, states or countries. (Beloglu, Bowen, Kotler & Makens 2017, 589.)
There are various methods to conduct demand analysis. However, for a start-up company as ours is first we need to conduct a direct test market and test our concept. It is relevant to do if a company launches a new product or service in a new distribution channel or territory. According to Hooley, Piercy and Saunders (2004, 250) there is a big variety of new-product forecasting methods, which can be quick and relatively cheap or profound and expensive. The former ones are aimed to test products before they even exist, while the latter test the whole marketing mix in a geographical region.

Conducting product-use tests marketers select a small group of potential customers who use their product or service for a limited time. Manufacturers learn about customers' requirements, while marketers follow their purchase intent and other reactions. In trade shows which are usually organized for a large number of buyers in a limited time manufacturers are able to check consumers' interest in the product, their purchase intent. Placing the product in distributor display rooms marketers can get preference and pricing information in the normal selling atmosphere of the product, since their product stands next to possible competitors' products. Standard or controlled test markets are used to assess the potential of new industrial products. Conducting this test manufacturers produce a limited supply of the product and sell it in defined geographical areas. The company advertises and promotes its product and gives it other marketing support. Following this method the company is able to test the product and its marketing programme in real market situations. (Hooley, Piercy and Saunders 2004, 254.)

2.2.2 Segmentation analysis

Beloglu, Bowen, Kotler and Makens (2017, 245) define segmentation as the process of dividing a market into distinct groups of buyers who might require separate products. Companies implement it and select right segments in order not only to meet their customers' expectations but to do it in the most effective way and to get their clients most satisfied. Segments of potential buyers form a market, which companies need to analyse to find right customers. The segment that a company chooses to serve is its target market.

We can segment a market according to the criteria suggested by John Kuada:

- Demographic characteristics are general variables which indicate customers' age, gender, occupation etc.
- Operating variables include customers' operational, financial, technical capabilities etc.
- Purchasing approaches refers to customers' decision making, e.g. what aspects they rely on choosing the product of this exact company.
- Situational factors include product application and order size. (Kuada 2008, 8.) vThis list could be supplemented with the criteria suggested by Munaga Ramakrishna Mohan Rao in his article "Market segmentation":
- Geographic segmentation refers to customers' location, e.g. country, nation, neighbourhoods etc.
- Behavioural segmentation is close to the notion of purchasing approaches introduced by John Kuada that was mentioned above. This criterion also implies consumers' knowledge of and attitude towards the product.
- Psychographic segmentation identifies customers' lifestyle, e.g. opinions, interests, activities.
- Segmentation by benefits which customers are interested in.
- Cultural segmentation enables to measure market penetration into cultural communities. (Rao 2015, 2.)

Analysing market a company can form its own list of variables which it finds appropriate. Although the criteria mentioned above are basic market segmentation types. Generally companies divide a market into 5-10 segments and select those ones which they want to serve. Choosing

the best segments means they are able to provide their customers with as many benefits as they can. It affects customer satisfaction and retention rates.

2.2.3 Competitor analysis

Paul Barrow in his book "The best-laid business plan" suggests a few aspects that a marketer should research while analysing competitors. They are aimed to clarify competitors' potential and companies' market opportunities in such competition. The aspects are the amount of competitors, their size, profit and product itself. To research this information a marketer needs to go through the following stages:

- Identifying who your competitors are. If a market is too big it is quite complicated to know all the competitors at the beginning. Paul Barrow recommends to use a business directory, e.g. Kelly's or Kompass. They can provide some data on the competing companies, their size, their products and services and the sales volume.
- Evaluating these competitors. A company might have thousands of them. In this case it is reasonable to narrow down the amount and choose only direct competitors for analysis. The peripheral ones can be analysed later on.
- Performing financial analysis in order to see how strong the competitors are. Paul Barrow suggests using a financial database such as FAME. It provides ratio analysis, which a marketer can use to assess the financial strength of competitors. Financial reports are necessary to study prior to strategic planning and during it since any market is constantly changing. They help in making better strategic decisions.
- Apart from the aspects mentioned above quality of the product or services, warranties, credit terms and company's reputation play an important role in market analysis. To find out this information a marketer needs more "creative" tools. Nowadays there are a lot of online services where one can find customers' feedback on companies' products and services, e.g. TripAdvisor in hospitality industry. However, sometimes marketers just need to become their competitors' customers for a while to have a chance to see everything from inside. (Barrow 2005, 151-155.)

The approach mentioned above is named as investigative research which is defined by John Kuada. To carry it out a marketer needs to follow certain procedures such as setting a goal for

investigation, agreeing on a set of research tools to use (online databases), finding a resourceful person to be in charge, avoiding analysis paralysis (specify the competitive questions); preparing questions he or she may ask. (Kuada 2008, 93-94.)

2.2.4 Pricing

Before setting prices we need to consider not only costs but also competition and consumer demand. The strategy of the business affects price levels. According Timothy S. Hatten (2006, 397), it is not rational to set too low prices when business is started. Lower profit may cause less cash flow. It means a manager has to reduce marketing, production costs, wages etc, which may reflect on quality of the product and attract less customers than it is expected. Moreover, customers who are seeking for low prices tend to switch to competing companies when they offer the same product twice less.

Price strategies depend on pricing objectives which are to be set prior to any strategy. Timothy S. Hatten suggests two categories of pricing strategies which are customer-oriented and internal oriented. Assuming we have the following objectives for this business: stabilize market prices, establish company's position in the market, build an image for business or product, develop a reputation for being fair with suppliers and customers. (Hatten 2006, 398-399.) The above objectives require customer oriented pricing strategy. It falls into prestige and psychological pricing. In this business plan we find it rational to the strategy of psychological pricing combining it with one of the internal-oriented pricing strategies which is cost-plus pricing.

> Psychological pricing is a marketing strategy based on the theory that certain prices have a bigger psychological impact on consumers than others (Boachie 2016).

A well-known technique is reducing the left digit from a round number by one cent. Pius Boachie gives the price of $3 as an example. Our brain processes $3 and $2.99 in different ways. We equal $2.99 to $2 unconsciously not to $3. Another famous technique is "buy one, get one for free" or its variations. Marketers are getting very creative at coming up with various special offers. However, they all are based on such a simple personality trait as greed. Customers want to get more for the same price. (Boachie 2016.) "Playing" with human psychology in relation to marketing strategies can be done in many other ways. It is limited to marketers' creativity and customers' interest in the offers presented in the market.

Setting prices for our product we also need to consider internal-oriented pricing. Cost-plus pricing is one of the most common techniques of pricing which is adding a specified percentage, markup, to the cost of the item. (Hatten 2006, 399.)

> Markup is the amount added to the cost of a product is setting the final price. It can be based on selling price or on cost. (Hatten 2006, 399.)

If the cost of a product is $1 and the selling price is $1.50, the markup is 33.3%. The formula that we need to calculate markup is the following: Selling price = Cost + Markup. To use marup effectively we need to calculate profit margin. (Hatten 2006, 400). It is highlighted in the financial part of this business plan.

2.3 Financial statements

Paul Barrow (2001, 73) states that preparing financial plans we thereby analyse the scale and profitability of our business over next few months, year etc. They also show when we need cash and when we will be generating cash enough to repay it. According to David H. Bangs (2001, 69) the heart of the operation is in its accounting system. The implementation of our policy depends on planning and using our plan as a means of controlling our business. The first step towards it is to establish bookkeeping system that provides us with the data based on income statement, cash flow analysis, breakeven analysis and other necessary documents. The bookkeeping system should be simple enough for us to keep up to date on a daily basis. Moreover, the bookkeeping should be suited to our special needs. Preparing financial statements we need to focus on our information needs.

> The income statement, also called the profit and loss sstatement, summarizes the income and expenses that your company has totalled over a period of time. The income statement illustrates the accounting equation Profit = Revenue – Expenses. Your income statement can generally be broken down into the following sections: net sales, cost of goods sold, gross margin, expenses, net income (or loss). Not only does the income statement show an itemization of your sales, cost of goods sold, and expenses, but it also allows you to calculate the percentage relationship of each item of expense to sales. (Hatten 2006, 223.)

Therefore, Income Statement is based on the Unit Sales Budget, Headcount Budget, the Operating Expenses Budget and becomes the central part of a financial model. The output of the

Income Statement is known as "net income", which shows the difference between a business's revenues and expenses. To get gross profit we deduct cost of goods sold from sales. Operating expenses that include salaries, rent, insurance, depreciation and miscellaneous expenses are to be deducted from gross profit. Thus, we get Income from operations or Operating Income, which is followed by Income before taxes. By deducting interest and taxes we have Net Income. (Proctor 2004, 76-78.)

According to Timothy S. Hatten (2006, 234-235) a company that is not managing its cash is poised for collapse. Poor cash-flow management causes the majority of business failures. The strategy of cash flow management is to maximize our use of cash. Cash flow is the sum of net income and noncash expenses, such as depreciation and amortization. Cash flow represents cash-to-cash cycle and the amount of time that passes between spending and collecting money. Therefore, for small businesses it is important to track their cash flows and know actual amount of money they have.

We also need to breakeven point analysis in order to find out how much beer we need to sell least. Breakeven point is the point at which a company covers its costs with its revenue. This metric represents how many units it needs to sell or how much money it needs to generate to cover all its costs. Breakeven point is total fixed costs divided by contribution margin per unit. (Proctor 2004, 211.)

2.4 Management and manpower

Each business needs management; otherwise it will be chaotic and cease to exist at all. Timothy S. Hatten (2006, 454-455) states that along with a big number of similarities there are a lot of significant differences in managing a small business and a big one. A manager of a small company faces more complex tasks and activities. Small businesses need to understand the tools and have practises of professional management when they deal with expectations if customers, associates and employees.

> Management is the process of planning, organizing, leading, and controlling resources in order to achieve the goals of an organization. These four functions are interrelated in that their achievement occurs as part of a progressive cycle. Planning begins the process, as the manager determines what to do. Organizing involves assembling the sources (financial, human and material) needed to accomplish the plan. Leading is the process of getting the most output possible from

> those resources. Controlling is comparing what was initially planned with what was actually accomplished. (Hatten 2006, 455.)

Apart from managing the team managers or business owners might need to fulfil their actual duties. Therefore, they need to balance these tasks in order to be efficient and make the best out if the resources they have. It might be more relevant on the earliest stages of business development. (Hatten 2006, 455). H.R. Appannaiah and H.R. Ramanth (2008, 9-10) present an overview of a manager's movement upwards from one level to another. They state, that on the upper levels technical skills become less important than conceptual ones, which include the ability to understand the organization as a whole.

In order to get things done a manager needs human resources when he or she focuses more on managing operational functions. Paul Barrow (2001, 212-216) recommends to consider the following issues during the recruitment process: number of new people needed; when they are needed; job skills they will need; anticipated remuneration costs; additional resources needed (equipment, workspace, cars etc.); any redundancies (if reducing parts of the business) – timing and costs. It will help to prepare a recruitment program. This evidence included into the business plan shows a manager is professional and capable of managing the HR growth process. It is also good to mention in the business plan what steps are going to be undertaken in order to retain staff. The following ways are stated to be effective in business: remuneration package (basic salary, performance-related bonuses, free medical cover etc.); promotion opportunities; personal development; creating a great working environment; communications; good management.

In this business plan we are aiming to consider outsourcing as one of the ways of coordinating human resource management activities. Nowadays a lot of companies turn to outsourcing in order to reduce costs and get work done probably with a better quality.

> Outsourcing is a practice used by different companies to reduce costs by transferring portions of work to outside suppliers rather than completing it internally. Outsourcing is an effective cost-saving strategy when used properly. (Investopedia)

David Pollitt (2005, 3) points out that managers are looking for new ways to reign in expenses, be more productive and focus on their business' core competences. It is not seen as elimination of jobs or substitute for effective workers. Outsourcing is strategic partnership that helps to put people at the top of corporate strategic decision-making. One of the major advantages

is improved customer service. Outsourcing companies might have better technology and process expertise which may dramatically improve the service or get the needed scope of work done in more effective way.

3 Craft beer production

In Europe craft beer is authentic beer produced by a craft brewery. It brews not more than 500 000 hl per year and not more than 20% owned by the brewing company which owns any other non craft brewery. Craft breweries produce all beers at original gravity and list all the ingredients on the label. (Brewdog 2017.)

Beer sales in restaurants have dropped by 54% since 1995 in Finland. However, sales in stores have increased by 32%. (Mara 2016.) Indeed we can observe a vast range of beers and other low alcohol drinks on the shelves of Finnish supermarkets. Even about 10 years ago the spectrum was limited mostly to lagers and porters. Last decade has changed Finnish beer market crucially due to growing competition between large breweries and quite new craft beer producers. These days restaurants and supermarkets offer not only pale lagers but also for example muncheners, dortmunders, bocks, as well as huge variety of ales brewed in Finland. There is still room for new types of beer in the local market. Therefore, we need to research beer production industry and brewing technologies so that we are able to develop our signature recipes. In order to start brewing beer we need to consider brewing technology which includes equipment, choosing malts, hops and yeast, malting, wort processing, fermentation and brewing hygiene.

3.1 Alcohol production and consumption in Finland

The statistics prepared by The Brewers of Europe show recovery in the brewing sector after the economic crisis in 2008 -2009. Overall consumption and production remain stable. Moreover, a big number of small breweries open around Europe. In 2014 exports rose to 8 billion litres, an increase of 15% since 2008 both within the EU and international markets. More than 1000 new breweries opened within 2014 which shows a 16% increase since 2013 and doubling since 2008. It definitely indicates what a significant input the brewing sector provides into economic development of Europe. (Carceller 2015, 4.)

Finnish brewing sector is developing steadily too. As for august 2017 there were 85 microbreweries registered in Valvira, National Supervisory Authority for Welfare and Health (Business Insider Nordic). This number almost doubled within 6 years. The Federation of the Brewing and Soft Drinks Industry (FBSDI), which members are Captol Invest Oy, Oy Hartwall Ab, Olvi Oyj, Red Bull Finland Oy, Saimaan Juomatehdas Oy and Oy Sinebrychoff Ab, provides relevant statistics on beer production, consumption and sales and the affect of Finnish legislation and alcohol restrictions on them. According to The Federation of the Brewing and Soft Drinks Industry (2015) Finnish excise duty rate is the highest in Europe. Alcohol producers are obliged to pay 32,05 EUR per litre of 100% alcohol for beer which alcohol content at least 2,8%. That is more than excise duty in such countries as the UK, Denmark, Sweden etc. Moreover, VAT of 24% included into the sales price and paid by customers is also higher than in most European countries. However, it is quite a standard rate for Scandinavia. There it varies from 24% to 25%. Although, Finland has tax relieves for microbreweries where yearly production is limited to 200.000 hectolitres. Depending on the production rate excise duty rate may vary from 16 EUR to 32,05 EUR per litre of 100% alcohol. For beer which alcohol content is 0,5%-2,8% tax rate is just 8 EUR. (European Commission 2016.)
The excise duty rates were increased several times. The last ones happened in 2012 and 2014 and it affected beer sales immediately. According to the statistics provided by the members of The Federation of the Brewing and Soft Drinks Industry beer sales dropped by 2% in 2013 and 2.9% in 2014 (FBSDI 2013; FBSDI 2014.) Tax increase reflected in cross-border beer trade with Estonia where excise tax is 8,30 EUR per litre of 100% alcohol (European Commission 2016). This huge gap between two neighbouring countries caused large scales travellers' alcohol import. Hallberg and Österberg (2015, 23) point out that the amount of 34,8 million litres of beer was imported to Finland by travellers in 2014. It is 10,4 million litres more than in 2010.

> Finland has the highest excise duty on beer in the EU, and cross-border trade is a significant phenomenon. According to the study, 50.8 per cent of Finns buy beer from abroad due to high domestic prices. A large percentage of these Finns (74.6) buy beer from Estonia. (FBSDI 2015.)

Denmark having Germany as a major neighbouring beer producer where excise tax is 1,9 EUR per litre of 100% alcohol reduced the tax on beer by 15% in 2013 as a part of Denmark's growth plan. As of July 1st 2016 the excise duty rate in Denmark is 7,51 EUR per litre of 100% alcohol. Hald states that the tax reduction boosted domestic sales and reduced travellers' alcohol import. (FBSDI 2015; European Commission 2016.) However, the new Alcohol

Act that will come into force in 2018 will not involve any changes in price reduction. It will alter mainly retail sale of alcoholic beverages and serving them. It will be allowed to sell alcoholic beverages up to 5,5% in grocery stores, kiosks and petrol stations. Independent breweries and microbreweries will get the right to sell their own craft beer at the breweries. Excising stores on wheels will be allowed to sell beer as well as Alko may get stores on wheels of their own to serve alcoholic beverages. Moreover, the opening hours of Alko will be extended by one hour. Alterations to serving alcoholic beverages will affect licencing process. There will be no ABC licencing system, but only one type of permit which will allow to serve all types of alcoholic beverages. Restaurants and bars will be able to apply for a licence to extend their serving hours until 3.30 am. The Alcohol Act will also include provisions on advertising alcohol. Apart from Alko and other retailers producers and wholesalers will get a permission to present information on their products in published additions and online. (Ministry of social affairs and health 2017.)

> In addition, restaurants could apply for a licence for retail sale of alcohol. The sale would be in accordance with normal retail sale regulations. These regulations include the maximum alcoholic strength by volume of beverages and hours during which retail sale of alcohol is permitted. (Ministry of social affairs and health 2017.)

Valvira, National Supervisory Authority for Welfare and Health, supervises alcoholic beverage producers and Alko Oy as well as issues licenses to produce, sell, import alcohol etc. It monitors and controls alcohol production and consumption. The other authorities related to the issue are The Regional State Administrative Agencies. They issue licences to serve alcoholic beverages, to extend serving hours and retail alcohol. They are responsible for supervising the serving and retailing alcohol, as well as the advertising and promotion of alcoholic beverages in their areas. (Valvira 2015).

3.2 Equipment

We will find out what equipment we need by learning basic brewing process. In this business plan we are considering a batch of 500 l. In figure 1 basic brewing process is depicted. For milling we need a roller mill which produces grist by crushing malt and leaving the husk aside. Mashing requires two devices, which are mash kettle and lauter tun. These two properties can be also combined together as we can see it in the figure. After the grinding process grist is mixed with water, stirred and heated at 77 °C. It is called mash. In the lauter tun hot water is

sparged over mash which plays role of a filter at this stage. As a result we get sweet clear wort strained into the brew kettle where the boiling process takes place. Depending on what kind of flavour a producer aims to get he adds hops into boiling wort at exact time after starting this process. (Sysilä 1997, 99.)

Right after boiling we need to cool the beer in order to prevent oxidizing. For the batch more than 100 l. a flow-through type wort cooler will be suitable. Fermenters can be different sizes and materials. However, for a large batch stainless still is the best choice the same as for a mash and brew kettles. Brewers use bottom-fermenting yeast producing lager beer. It can be fermented at low temperatures in range 4-10 °C (Sysilä 1997, 100). For this purpose there should be a conditioning system installed in the premises. Fermentation is split into primary and secondary stages. Filtering and conditioning are the phases of the latter one needed to settle the beer and remove yeast from it depending on the beer style. It requires a conditioning tank and a filter. Packaging is done with a bottle filler, a keg washer and a keg filler.

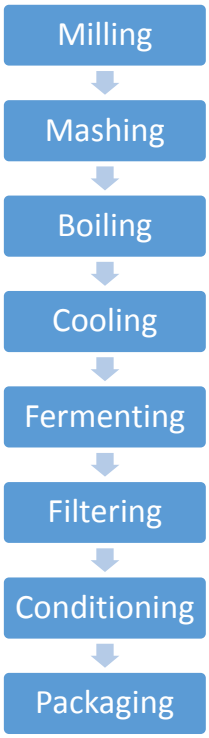

Figure 1. The brewing process

Apart from the equipment mentioned above we also might need the following tools: an air-lock, a thermometer, a hydrometer, a sample jar, an Erlenmeyer flask, laboratory glass tubes, pincers, disposable rubber gloves, airlight rubber bungs and lids, a pump (Sysilä 1997, 100).

3.3 Adding flavourings to beer

> It is an understatement to say beer is an incredibly complex beverage. According to a recent study in the Journal of Food Engineering, beer is thought to contain more than 560 aromatic compounds. (Herz & Conley 2015, 12)

That amount aromatic compounds can be extracted just from 4 main beer ingredients: malt, hops, yeast and water. Brewing is all about chemistry and chemical processes. Brewmasters are chemists exploring texture and components of the ingredients, combining them and seeing which aromas they can get from it. The term craft beer perfectly characterizes the process of small scale beer production which purpose is to originate beer styles different from mass beer. In the USA a craft brewer is a brewing company producing less than six million barrels of beer a year and independently owned as it is defined by the Brewers Association. It is always good to support a local brewery, since they are usually a part of the community and a place where people can get the freshest beer. (Herz & Conley 2015, 13.)

Flavours and aromas depend on the malt we use, its processing technology, as well as hops and yeast. Each of these ingredients gives beer distinctive tasting notes. Barley is the most broadly used grain for malting. However, beer can also be made of wheat, rye or corn. Lighter malts taste like toasted bread crust, biscuit, for example. Dark-roasted malts have notes of roasted walnut, burnt toast, coffee, dark chocolate or even pipe tobacco. In-between these two levels there are caramel malts which have flavours of butterscotch, caramel, burnt sugar, toffee etc. Hops give beer bitterness and a lot of variable tasting notes. Hoppy beers are usually fruity and have such aroma notes as apple, pear, mango, pineapple, orange, lemon, lime. One can also find uncommon hop flavours in beer, for example black current, muscat grapes, herbal tea etc. Yeasts convert sugars into alcohol and carbon dioxide. For that yeast in the genus Saccharomyces or wild one in Brettanomyces are used. It can create flavours such as banana, apple, pear, anise, pepper, bubble gum, clove, lemon etc. Because of yeast beer can also have earthy, musty, bready or nutty notes. The role of water cannot be underestimated. It makes up 85-95 % of beer. Although water does not have a dominant flavour in beer it contains minerals such as calcium, magnesium, sodium, zinc, sulphates, chlorides etc. It can affect the character of beer. (Herz & Conley 2015, 13-18.)

Other ingredients can be added in two ways either direct or indirect infusion. According to Craft Beer & Brewing Magazine the first method implies just adding ingredients together with hops or before them. The second method is more complicated and longer. It requires flavour

extract separated, prepared and added to the beer. The original flavour additive will be left behind. Both methods are widely used depending on the ingredients, e.g. coriander, fruit juice or cacao are suitable for direct infusion. Indirect one might take longer time, but it has more advantages. A brewmaster can taste the extract, its relative strength in the beer and add more if necessary. (Montez 2017.)

Among common and suitable ingredients, which are used for infusion, are coffee, spices and fruit. Coffee is an excellent component for stouts and porters. However, Jay Montez (2017) states that the flavour of coffee fits surprisingly well pale styles too. It adds bitterness which lagers contain too. Therefore, basically coffee strengthens the taste of pale style beer not only changes its texture. It is recommended to add ground coffee beans to the secondary fermenter a few days before packaging. It will not make beer to bitter and will add fairly enough flavour to it. Brewers choose from which region they need coffee depending on what flavours they want to extract from it. Asian coffee is quite earthy and heavy, while African one offers fruitiness and rich acidity. South American countries produce rich and full-bodied coffee.

There is a big variety of spices that can be added into beer. Among common ones are nutmeg, cloves which are used in ales, coriander is typical for Belgian-style white beers (Jackson 1998, 17). According to Craft Beer & Brewing Magazine spices can include berries, seeds, roots, but not leaves. Cardamom, ginger, liquorice, star anise, juniper, lemongrass are commonly used in brewing. However, the list of spices is not limited to the ones mentioned in this work. All the spices can give either very strong and intense flavour to beer or slight hints of them depending on how long a brewer keeps them in the wort and the stage when he adds them.

3.4 Recipe development

Lesterud (1999) suggests that while choosing ingredients for the beer recipes a brewer has to consider a lot of important things. Developing a recipe and selecting ingredients for it is demanding and at the same time creative and rewarding aspect of brewing. The result of this working process is a brewer's signature beer.

> "The type(s) and amount(s) of malt(s) in the mash, the mashing schedule, the bittering hops. the aroma hops, the hopping schedule, the type and strain of brewer's yeast and the fermentation temperature are the primary factors that determine the characteristics of the finished beer." (Sysilä 1997, 204.)

According to Sysilä (1997, 204-205) the following brewing issues have to be considered while planning recipes: malt bill, amount of malt, mashing schedule, hopping and yeast. Malt bill is a combination of malts in the mash. There can be different types of them combined together and one used as a prime source, e.g. Pilsner malt can be a prime source for any beer. The total amount of malt a brewer needs depends on the volume of wort, its strength (specific gravity) and the efficiency of the equipment. The higher the specific gravity, the more malt is required. The quality of grist and brewing water affect the extract efficiency of the mashing and straining process. A good result is 75%.

Mashing schedule implies temperature change during the mashing process. Temperatures may vary. Palmer (2015, 78) gives an example of a popular multi-rest mash schedule. It is 40°C - 60°C - 70°C plus a half hour rest at each temperature. At the temperature of 40°C mash gets more liquid. This process of liquefaction activates enzyme which coverts starch into sugar. Resting the mash at this temperature improves yield regardless which malt a brewer uses. The temperature of 60°C - 70°C is needed to adjust fermentable sugar profiles, e.g. resting mash 20 min at 60°C and 40 min at 70°C afterwards will produce sweet and quite heavy beer. Switching the times will make beer lighter and drier even if a brewer uses the same malt. However, temperature combinations can be different. A brewer can "play" with them to discover the taste which fits his or her product better, as Palmer recommends.

Hops are chosen depending on the style of the beer produced. After selecting bittering hops and aroma hops a brewer can set the amount of hops needed and the hopping schedule. It is important to know at which stage to add hops. As believed by Million (2003) hops add bitterness, flavour and aroma. Adding hops is possible in the primary, secondary fermentor or in the keg. The secondary fermentor is considered to be better than the other stages due to the fact that the aroma of the beer will be more distinguishable since CO2 activity is over at this stage. One more reason is that the alcohol and low Ph help to remove unnecessary bucteria from unsanitized hops during the second fermentor.

> The bitterness comes from alpha acids contained in hops, while flavor and aroma come mostly from volatile oils. The term volatile refers to the fact that the oils boil out of the wort relatively quickly — most within 15-20 minutes. This is why brewers normally add flavor and aroma hops closer to the end of the boil. For maximum flavor and aroma, and to preserve as much of the volatile oils as possible, some brewers practice dry hopping. Nowadays, dry hopping refers to any hop addition after the wort has been cooled. (Million 2003.)

Lesterud (1999) states that selecting a yeast strain for a certain style of beer is an integral part of recipe formulation. Each beer product is unique partly due to a brewer's signature recipe and partly due to a house yeast strain. There are several aspects that are important to consider while selecting yeast. For instance, flocculation is the ability of yeast to settle at the end of fermentation. At this stage beer gets clear due to flocculation. It can be classified as high, medium or low. Each beer style has its own characteristics related to flavour and aroma which yeast also contributes into. If a beer drinker takes German weizen he or she expects to feel banana aroma, for instance, since it is a distinctive feature of German weizen yeast. Degree of attenuation is the most significant aspect to be considered. Attenuation is the process of transforming sugars into alcohol during fermentation. Brewers pay attention to a strain's degree of attenuation. Knowing it a brewer can predict the final gravity of beer produced. Degree of attenuation is classified as high, medium or low. Although, it also can be represented as percentage. The less attenuative a yeast strain is the higher is the final gravity. A beer style is formed by a few factors. The appropriateness of the yeast strain is one of them. Therefore, a brewer has to choose a yeast strain that contains characteristics which are expected from this certain beer style.

To form the recipe we need to calculate a few numbers. Czigler (2017) recommends to use the following formulas to find out IBU (International Bitterness Units), gravity, mash temperature, volume of infusion water, ABV (Alcohol by volume).

- IBU = AAU x U x 75 / Vrecipe , where AAU – Alpha Acid Units (AAU = oz x AA%), where oz - weight; U – Utilization based on boil time and gravity (the time and gravity of the boil); 75 - a constant for the conversion of English units to Metric; V – recipe volume.
- Wpounds x PPGmalt/Vwort = PPGextracted, where Wpounds – pounds of malt mashing; PPG – Points/gallon (Grain style specifics); Vwort – Volume of wort in kettle; PPG – Points/gallon extracted max.
- Twater = 0.2/ratio x (T2 – T1) + T2, where Twater – targer mash water temperature; 0.2 – thermodynamic constant (0.41 for C); ratio – water to grain ratio (in qts/lb); T2 – target mash temperature; T1 – grain temperature.
- Vwater = (Tr1 – Tcurrent) x (0.2 x Wg + Vmash)/(Tiw – Tr1), where Vwater – volume of infusion water; Tr1 – targer rest temperature; Tcurrent – current mash temperature; Wg – grain weight; Vmash – volume of mash; Tiw – temperature of infusion water.
- ABV = (OG -VG) x 131.25, where ABV – pounds of malt mashing; OG – original gravity; VG – final gravity.

However, all the calculations can be fulfilled with a software too. One of them is BeerSmith 2.

4 Business plan

This business plan lets the future owners of the F&F Brew Co. brewery outline company establishment process and go through all the necessary details as well. Here we intend to contemplate the following aspects: business idea, HR, market research, product development and financial plans.

F&F Brew Co. is a microbrewery located in the industrial area of Hyvinkää. It occupies the premises of 200 m^2 with brewing and beer packaging equipment, laboratory, storage room and office in them. The capacity of the brewing equipment is 500 litre/batch. At the start-up stage we are aiming to brew 4 beer styles. However, the range of beers we are capable of producing is not limited to this number. Growing the business we will introduce a bigger range of products to our target group. Our main distribution channels are Metrotukku and Alko, the retail monopoly of beverages in Finland, at the stage of entering the market.

F&F Brew Co. is a limited company (Oy) owned by 4 shareholders with the share capital of 53000 euros. Prior to establishing our company we create Memorandum of Association with the Articles of Association appended to. The company is licensed by Valvira to produce alcohol beverages.

4.1 Business idea

> She picked up the stout and took a sip. It slid down her throat like silk (Sheridan 2015, in GoodReads).

The concept of F&F Brew Co. is based on the idea of infusing our beer with different sometimes unexpected and quite surprising ingredients. Producing craft beer our primary purpose is to make people enjoy, feel different notes in beer and discover new flavours. We aim to bring rural and urban hints to the beer at the same time in order to reflect European lifestyle in the taste of the brew. To escape boring and predictable mass production beer our followers, this is how we call our target customers, will have a chance to indulge themselves in craft beer. Our product is not only a modern version of old-fashioned traditional European beer styles, but also a combination of unique ingredients.

Establishing our brewery we are aiming to use environmentally friendly technologies such as recycling waste water and using it for machinery cleaning and washing used bottles. Solid waste such as spent grains and yeast can be sold for livestock feed. At the growth stage of our business life-cycle we intend to invest into environmentally friendly and sustainable energy sources such as wind power.

F&F Brew Co. respects nature. Therefore we are launching an organic product line complying with all the requirements of European Commission. It will improve our competitiveness on the market and allow us develop and modernize our production technologies accordingly. The main activities we are going to undertake in order to develop our organic product line are as follows:

- cooperating only with the reliable suppliers who guarantee that they are using neither genetically modified organisms, chemical pesticides, fertilisers nor antibiotics
- ensuring that we do not use food additives or processing aids
- attempting at supporting local producers and using local resources.

As the business is founded in Finland we will obtain a license for the production of alcoholic beverages which is issued by Valvira, National Supervisory Authority for Welfare and Health. As it is required we will also submit details of our volumes produced three times a year and our total sales monthly to the Valvira product register. Producing organic beer we also need to enrol in the organic production control system as it is required by the Authority mentioned above. (Valvira, 2016.)

Our mission is to create the product, which will give the company an opportunity to meet competition, fill a niche in the beer market and offer our followers experience of tasting, drinking and enjoying brand new flavour combinations. The principles forming our business idea are as follows:

- creating value and making our future sustainable;
- being different from our competitors as well as insuring we are able to offer something unique to our followers;
- complying with the laws and standards of the environmental responsibility;
- developing our production and business as a whole following technological progress;
- expanding our product line by creating new combinations of flavours and following our customers' opinions;
- being environmentally friendly;

- treating each other respectfully, establishing a cohesive team and a positive work environment.

Our vision is transferring culture of drinking beer into culture of tasting, enjoying it, sharing opinions on it and indulging yourself in incredible flavours.

4.2 Human resources

At the starting point the company is going to consist of 3 permanent full-day workers who constitute the core manpower of it. We will also need experts' guidance. Therefore, the tasks, which are out of scope of workers' duties such as finance, payroll, legal issues , are going to be outsourced. We expect the production to grow twice within 3 years. If this target is achieved we will need to recruit more workers. At the start-up life cycle stage the positions of CEO, a technical brewer and a quality assurance manager are needed. Below there are examples of vacancies we aim to place in job search online services.

Technical brewer

F&F Brew Co. invites experts in beer brewing to apply for a position of a technical brewer. The start-up company is proud to announce the opening in 2018. If you are willing to make your own contribution into our production, inspire us with your ideas and get inspiration from what we are doing this work place is definitely worth of applying. You will work in tandem with our Quality Assurance Manager in order to make the best possible product and ensure the quality is just as good as our followers expect it to be. Together with you we will come up with new recipes, select new ingredients, brew something uncommon, test it in our laboratory, produce and represent it to the world.

Your duties:

- Recipe development and ingredient selection
- Managing the whole brewing process from receipt of raw materials to bottling beer (malt milling, wort transferring, yeast pitching, fermentation, filtration)
- Control of production process
- Cleaning equipment and doing the general cleaning of the brew house
- Following standard operating procedure and production standards

Quality assurance manager

F&F Brew Co. invites experts in beer brewing to apply for a position of a quality assurance manager. The start-up company is proud to announce the opening in 2018. We have an excellent idea, inspiration, fancy recipes and already some followers who are eager to try out our product. However, we really need you to ensure everything we produce is excellent quality. Your duties combine great responsibility, creative approach and personal initiative. F&F Brew Co. is going to brew traditional European beer styles with new and uncommon flavours. Therefore, you will have a huge field to explore and learn using your and our experience at work.

Your duties:

- Continuous improvement of quality management systems
- Taking lab tests and preparing analytical laboratory reports
- Providing technical support to production
- Implementing laboratory process improvement projects
- Following alcohol production requirements and standards.

Requirements for the candidates for both positions: we expect you to have passion for brewing and take the initiative at work. Apart from it you should have a degree either in chemistry, microbiology or fermentation science. Laboratory experience, technical and practical brewing knowledge are required. Bottling experience is an advantage. This work might be stressful from time to time. Therefore, you should be able to resist stress and be ready to make decisions fast in difficult situations.

We offer the candidates for both positions permanent full-time job with the salary of 3500 euros plus extra according to TES and bonuses, various trainings related to work, personal developments programme, health insurance and positive and creative work environment.

The founder of F&F Brew Co. will take up the CEO position and have the following responsibilities: arranging the working process; controlling operations, planning and developing business and the company operational structure; searching for reliable suppliers and business partners; managing production process and participating in product development; leading the company and creating a positive work environment.

4.3 Market research

Prior to developing our product we need to analyse the market and our competitors in order to find a possible niche. Statistical analysis will allow us to find out who is our potential customer and which distribution channels we can operate. It will also give us a perspective to the best possible product we can develop basing on our customers' preferences. We also need to do competitor analysis due to the fact that the beer market is broad in Finland and it is growing every day. As it is mentioned above there are 85 microbreweries registered in Finland as for 2017 (Valvira). All of them are our potential competitors.

4.3.1 Market analysis

This research report aims to give a quick foretaste on the drinking habits and preference of habitual beer drinkers in Helsinki area. A simple, 6-question survey was distributed online amongst habitual beer drinkers and gathered 99 responses. Questions regarding their drinking habits include frequency of drinking, regular place where they buy their beer, and their preferred drinking companies. Questions regarding their preference include their preferred type of beers and their possible interest in craft beer. Descriptive analysis was employed to analyse the responses: frequency to show the distribution of each variable (question) and cross-tabulation to show the distribution of two variables/questions (e.g. frequency of drinking vs gender). This report utilises graphs to present results of the analyses.

There were 34% female and 66% male in this survey, of which their respective drinking habits and preference of beers will be highlighted in the remaining of this report. Over half of respondents were weekly beer drinkers – drinking at least once a week (33.3%) or more frequent (18.2%). Both male and female respondents in this survey were majority weekly beer drinkers. A quarter of male respondents (25%) drank more than once a week, whilst almost a third of female respondents (32%) drank beers about once a month (Figure 2).

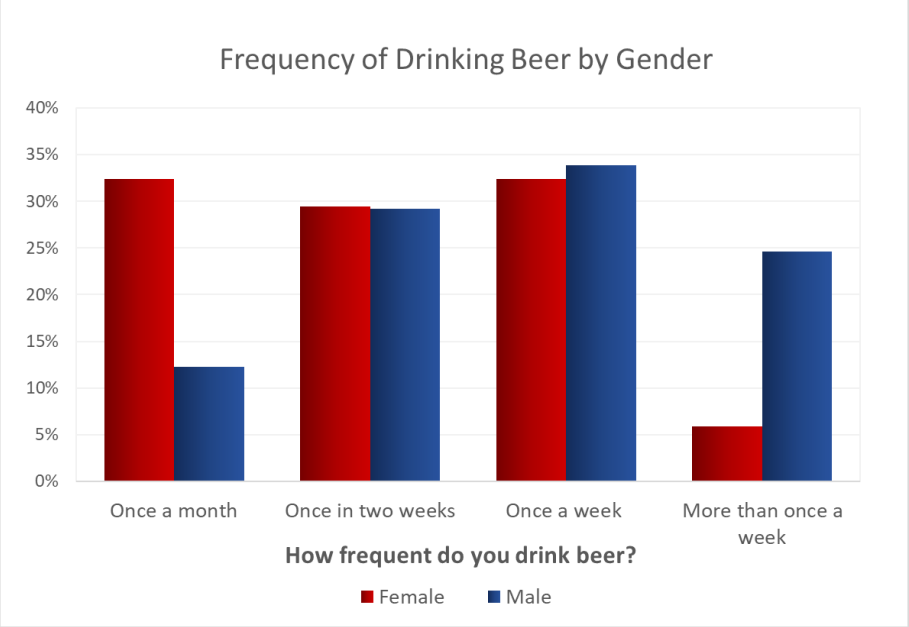

Figure 2. Frequency of drinking beer by gender

Overall, supermarket is the most likely place to go for respondents to purchase their beers (44.4%), followed by restaurant/bar (36.4%). Male respondents were likely to purchase their beers from supermarket (51%), whilst their female counterparts were likely to purchase their beers from restaurant/bar (56%).

Table 1. Where do men and women prefer to purchase beer

Gender	Where do you mostly purchase beer?			Total
	Duty free shop/outside Finland	Restaurant/bar	Supermarket	
Female	4	19	11	34
Male	15	17	33	65
Grand Total	19	36	44	99

Respondents who were likely purchase their beers from supermarket were weekly drinkers – those who drank once a week (48%) or more (61%). Respondents who drank less frequent were likely to purchase their beers in restaurant/bar (Figure 3).

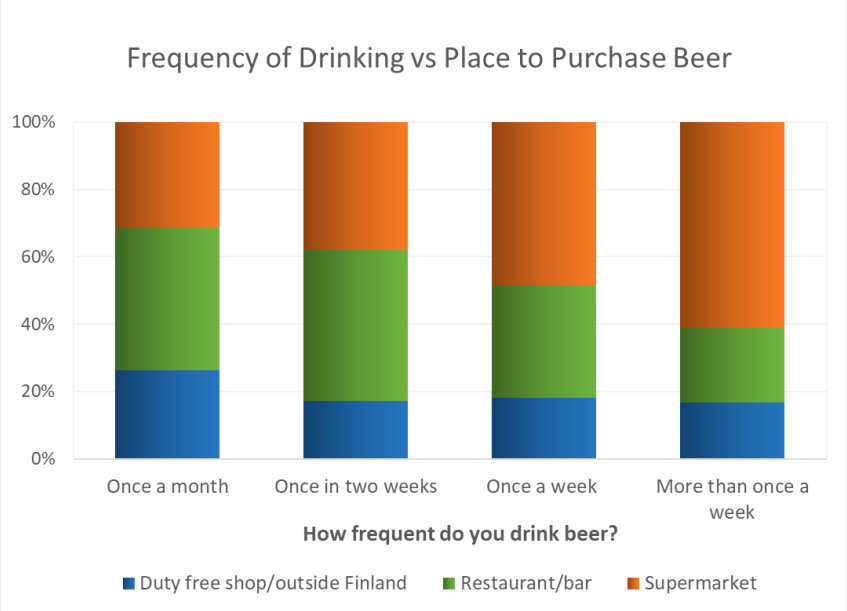

Figure 3. Frequency of drinking vs place to purchase beer

Almost half of respondents (49.5%) have no gender preferences when inviting their friends for a beer. Majority male and female respondents were likely to invite their friends for a beer without any gender preference. However, more male respondents were likely to invite friends from same gender (34%) compared to their female counterparts (29%).

Top 3 most popular types of beer: German lagers (22.5%), Czech lagers (17.5%), and German Hefeweizen (17.5%). Of the respondents who chose the most popular types of beers, almost half of them went to supermarket to purchase German lagers (41%), Czech lagers (47%), and German Hefeweizen (47%). About quarter of female respondents (26%) opted for German Hefeweizen as their favourite beer, whilst male respondents (24%) opted for German lagers (Figure 4).

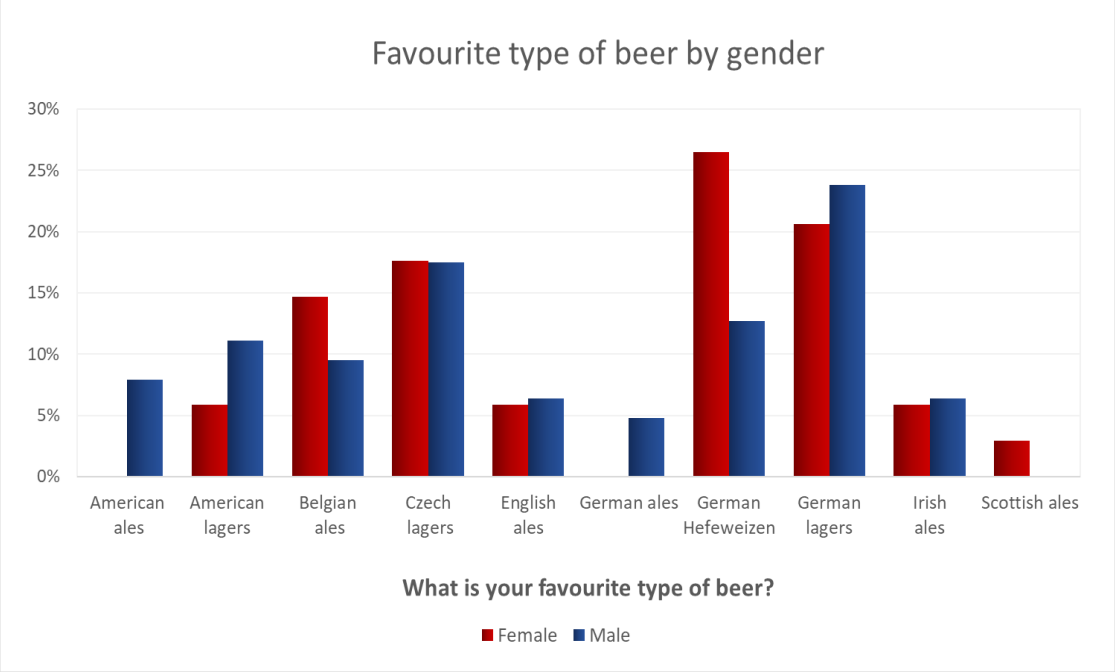

Figure 4. Favourite type of beer by gender

Respondents were asked to score their interest in craft beer from 0 ("not really interested") to 7 ("extremely interested"). Calculation of overall scoring resulted in an average score of 5.3, which surpassed "interested" mark. Graph distribution indicates that majority of respondents expressed their interest in craft beer – 24.4% "interested", 28.3% "highly interested", and 23.2% "extremely interested". None of the respondents gave score 0 in this survey. Results based on gender indicate that based on average score, female respondents showed more interest in craft beer (avg. score 5.35) compared to their male counterpart (avg. score 5.29) by a slight margin. Graph distribution shows significant proportion of female respondents (35.3%) with high interest in craft beer (Figure 5).

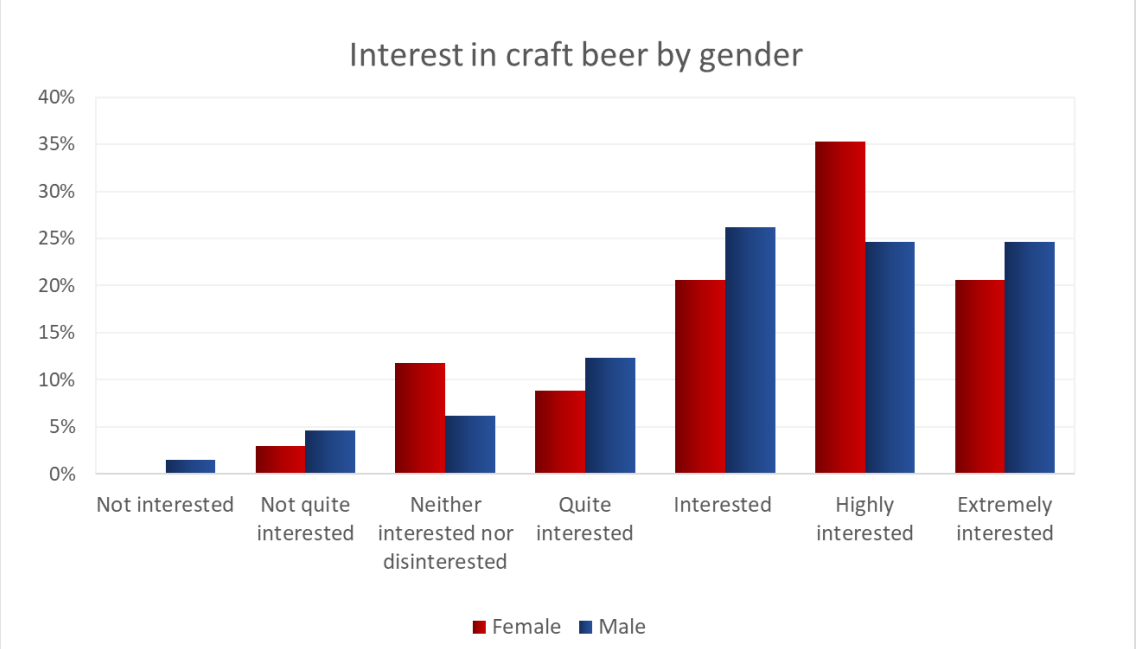

Figure 5. Interest in craft beer by gender

Majority of respondents in this survey were male. The high number of completed responses (no skipped questions) suggests that respondents were habitual beer drinkers who have developed their habits and preferences. Highest proportion of respondents were weekly drinkers and purchased their beers from supermarket.

Weekly beer drinkers were likely to buy their beers from supermarket, indicating majority of them drink beers at home as part of their lifestyle. Significant proportion of male respondents were in this group. Those who drank less frequently (every two weeks or monthly) bought theirs from restaurant/bar, indicating most of them were likely to be social drinkers. Significant proportion of female respondents were in this group. Overall, there was no gender preference amongst respondents in choosing their drinking companion.

The top 3 types of beer listed by respondents: German lagers (most preferred by male), Czech lagers (almost equally preferred by both genders), and German Hefeweizen (most preferred by female) – likely purchased from supermarket. Respondents from both genders showed high interest in craft beer.

We can draw the conclusion basing on the survey. Our target is the residents of Helsinki area or foreigners living or visiting it. They are regular drinkers purchasing beer mostly in the supermarket and in the restaurants (pubs, bars, nightclubs). They are both men and women highly

interested in craft beer. The product they are likely to purchase is German and Check lager, Hefeweizen and Belgian ale, which are the most popular beer styles among the survey respondents.

4.3.2 Competitor analysis

We can find data on all craft beer breweries in the official website of Suomen pienpanimot. In order to narrow down the number of competitors we are aiming to analyse only direct ones in this business plan. Our direct competitors are those local microbreweries that sell their product in the supermarkets of Helsinki area , such as S-market, Prisma, K-market, Alko. Among them there are Radbrew, Open Water brewery, Sonnisaari, Coolhead, Stadin Panimo, Teerenpeli, Humalove, Bryggeri, Maku, Panimo Honkavuori and Fat Lizard.

Maku is a young brewery (founded in 2014), which is becoming popular and well-known in Helsinki quite fast. They brew huge variety of classic beer styles, but do not infuse with other possible ingredients. The brewery participated in Suomen paras olut competition in 2014 and got the second place with its IPA. Apart from Alko Maku is also in stock in Prisma and some S-Markets. Radbrew is a brewery from Kaarina with 1100 liter beerhouse. They have quite an unusual concept related to postapocaliptical theme. However, beer they brew is not as unusual as the concept. The beer styles are classic, the beer is quite predictable. The brewery is very active in social media though. The website has a lot of content, they also have their own channel on YouTube and accounts on Facebook and in other social media apps. There is also the same type of brewery in Maarianhamina. Open Water Brewery was opened in November 2016 and gained some popularity too. Their brewhouse is capable to produce 1000 l at a time and they have regular beer styles too. Unlike Maku Radbrew and Open Water Brewery sell their beer only in Alko and online.

Coolhead does not produce huge amounts of beer yet, only 10000 l per year. However, it is a young brewery which was founded in 2014 and launched production in 2016. They are very creative and quite unique. Producing sour beers they are focused on fruit infusions which creates serious competition for us. Teerenpeli is another serious competitor of ours. This brewery has a big experience comparing to the ones described above. They also have a distillery and produce whisky and other spirits nowadays. Teerenpeli was opened in 1995 in Lahti. Their beer production reached the amount of 450000 l per year and apart from classic beer styles

they have some creative infusions, e.g. passion fruit ale, coffee ale etc. The brewery sells its beer not only in supermarkets, bars, restaurants, but also they have their own pub in the city centre. The brewers of Stadin Panimo have deep knowledge and big experience, since the brewery is going to celebrate 20-year anniversary in 2018. Although, they do not produce as much beer as Teerenpeli. Stadin Panimo is well known has its own bar in Helsinki, where one can try various classic beer styles.

Sonnisaari is a microbrewery with a creative touch founded in 2014 from Oulu. The range varies from classic pils to apricot IPA. However, the latter one is the only beer they infuse with fruit. They sell their product in Alko only in Helsinki area. Honkavuori is a brewery quite similar to Sonnisaari. It was opened in 2015 in Joensuu. They delivery beer also to Alko in Helsinki. Their selection is also limited to classic beer styles only. Fat Lizard Brewing Company is a more serious competitor than two previous ones. The brewery opened in 2013 in Espoo was producing 600 l per week. Within 4 years the turnover has grown 20 times. They have a big range of various styles, as well as beers infused with mango, raspberry, kiwi etc.

Bryggeri is another relatively young brewery (2013) and very strong competitor for all Helsinki breweries. It is located in the heart of the city with its own beer restaurant. The company is very active in social media. They promote themselves as the brewery producing beer which may supplement Nordic food experience. Bryggeri brews classic beer styles, plays around with various malts and yeasts. However, they do not infuse beer with any other possible ingredients like spice, fruit, vegetable etc. One can find Bryggeri and other brands like Stadin panimo, Maku, Humalove in Alko and big supermarkets like Citymarket and several K-markets. There are separate shelves just for Finnish brands.

SWOT analysis

The data analysed above lets us see strengths, weaknesses, opportunities and threats that our company has at the start-up stage. With SWOT analysis we will be able to assess how strong or how weak our business is, what we need to reconsider, what obstacles we might have and if we have any opportunities to grow in the industry.

Our strengths are as follows:

- The product is unique in the Finnish market and will attract beer lovers with its unusual combination of tastes and decent quality;

- Organic product line that we are launching is a trend that gets modern buyers curious and interested;
- Our target group includes both women and men. Therefore, the product is for male and female followers;
- The team consists of 3 full-time workers which is enough at the initial stage. It will allow us to follow the schedules, produce the exact amount of beer we are planning to and deliver it on time;
- The raw materials are high quality and delivered by our suppliers who we trust;

Our weaknesses are

- The idea is not unique. There are companies in the market that produce the same type of product;
- According to the competitor analysis, we have 11 direct competitors, which is a big number;

Our opportunities are:

- Growing the business we are going to search for new distribution channels, e.g. hotels and restaurants;
- Our growth opportunities are not limited to the Finnish market. We have potential to develop to other European countries and Russia.

Our threats are:

- The legislation affects alcohol market. It might happen so that at some stage it will be hard for the company to survive if laws are toughen up;
- Due to the fact that the product is unique in the Finnish market it might happen it will not gain popularity as fast as we expect.

4.4 Product development

Developing the product our objective was to create something, which has already gained some popularity, and add our touch to it. According to the statistical analysis above 28.3% of respondents is "highly interested" and 23.2% is "extremely interested" in craft beer. It shows us how popular this product is in Finland. We went further and found out which beer styles beer lovers prefer and researched the gender factor in this aspect. Based on the data summary we

have created the recipes of the following beers: banana HeFeWeizen, rhubarb rose saison, elderflower lime lager and corn roggenbier. We have used BeerSmith software for recipe development. Ingredients, brewing methods and beer styles are programmed in it. Therefore, with this software it is possible to edit and correct recipes if there is any mistake in proportions. Entering the variables we can check what IBUs (bitterness), original gravity, ABV and colour we will get at the end.

Banana HeFeWeizen

It is regular wheat beer very well known and popular in Germany where we got inspired to brew it. In the central parts of Germany and in Bavaria bartenders mix locally produced HeFeWeizen with banana puree in the restaurants and bars. Lactic nature of wheat beer perfectly fits the taste of banana and remind of alcoholic milkshake. HeFeWeizen is non filtered beer, therefore yeast remains in it and makes beer quite thick and lactic and sour, while banana adds some sweetness. This way we get excellent HeFeWeizen balanced in taste, colour and bitterness.

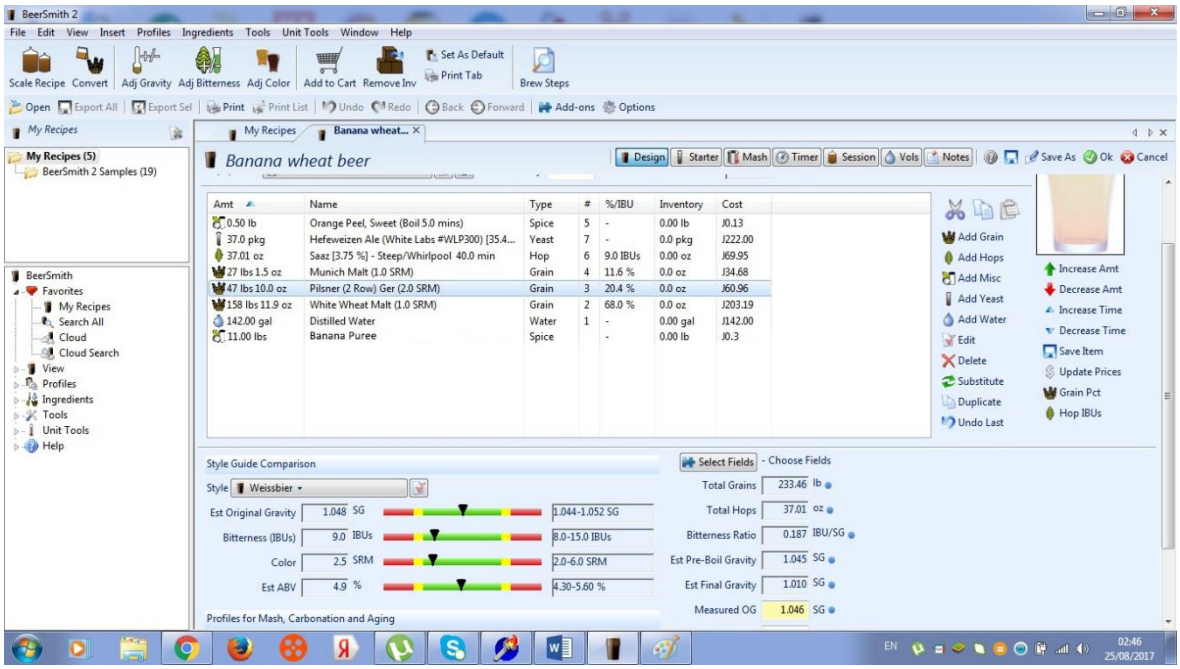

Figure 6. Recipe of banana HeFeWeizen

In figure 6 we can see the recipe of banana HeFeWeizen which includes Munich malt, Pilsner malt, white wheat malt, White Labs yeast, orange peel, Saaz hops, distilled water and banana puree. The indices we have got are: OG 1.046, ABV 4.7%, IBUs 9.0 and 151.6 kcal.

Corn roggenbier

This traditional German beer style is made of rye malt. Brewers can use up to 60% of rye in it. However, in our recipe we have combination of barley, rye and corn. These ingredients altogether will give beer the taste which will probably remind of bourbon. Since American whisky is made of rye and corn and beer is one of the stages of distilling whisky. We decided to release this stage and give our followers a chance to try this unique taste. Corn roggenbier is dark, dry and spicy. Therefore, we expect our male followers to try and enjoy it.

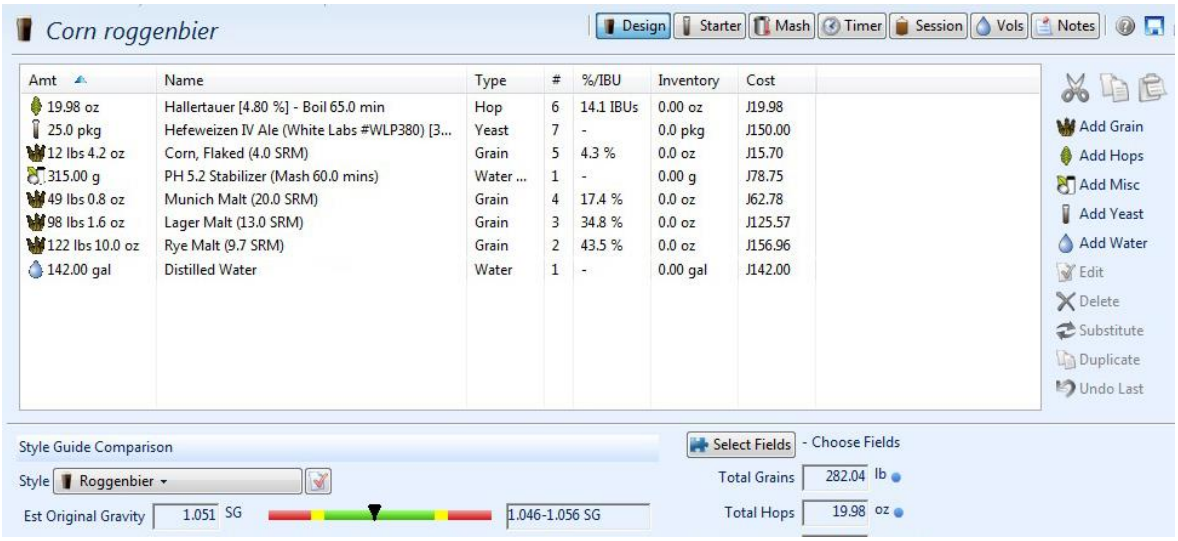

Figure 7. Recipe of corn roggenbier

In figure 7 we have the recipe of corn roggenbier which contains Munich malt, Lager malt, rye malt, flaked corn, distilled water, Hallertauer hops, HeFeWeizen 4 ale WhiteLabs yeast and PH stabilizer. At the end we get OG 1.010, ABV 4.7%, IBUs 14.1, 151.6 kcal.

Elderflower lime lager

We expect this type of beer to be our most popular product. According to the survey we conduct German and Check lagers are most drinkable beers. 22.5% of respondents prefers to drink German and 17.5% likes Check lagers. Regarding the additives lime gives slight sour taste to the beer which fits lagers very well and this fruit reduces the bitterness of beer making the taste quite balanced. Elderflower has been a very popular additive in drink during past few years. Elderflower syrup is added into Hugo cocktail, which was a trend in the restaurants of Helsinki, a couple of years ago. This is how this additive was introduced to people and how it became popular. These days one can find also elderflower cider and cordial in the shops of

Finland. This plant gives quite mild taste and quite strong aroma to the drinks. Elderflower and lime is perfect combination especially if we think about lightness of lager.

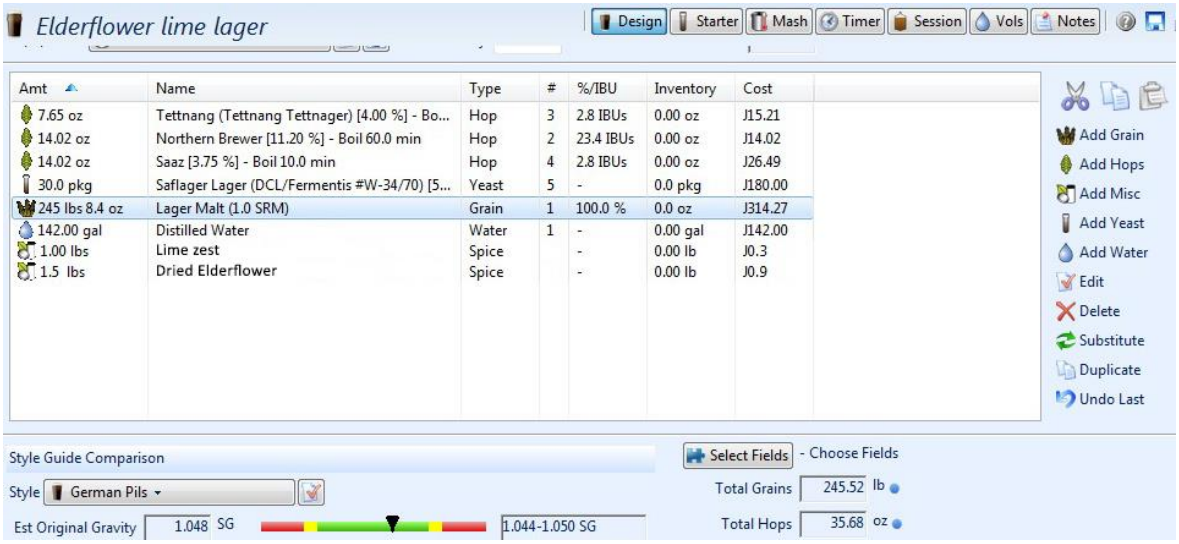

Figure 8. Recipe of elderflower lime lager

Our recipe of elderflower lime lager represented in figure 8 contains lager malt, Tettnag, Northen brewer and Saaz hops, Saflager lager yeast, distilled water, lime zest and dried elderflower. This way we get the following indices: OG 1.046, ABV 4.7%, IBUs 29.0 and 151.6 kcal.

Rhubarb rose saison

This beer will have really complex and interesting taste due to the additives and the nature of the beer style. Saison is Belgian pale ale, fruity spicy and quite hoppy traditionally. The same as elderflower rhubarb is a modern trend in food and drink additives. It has strong tart taste. This is the reason we add a little of it. Moreover, beer contains sugars which neutralize tartness. Small amount of rose water will give slight soft aroma to this strong combination of various malts, hops and additives.

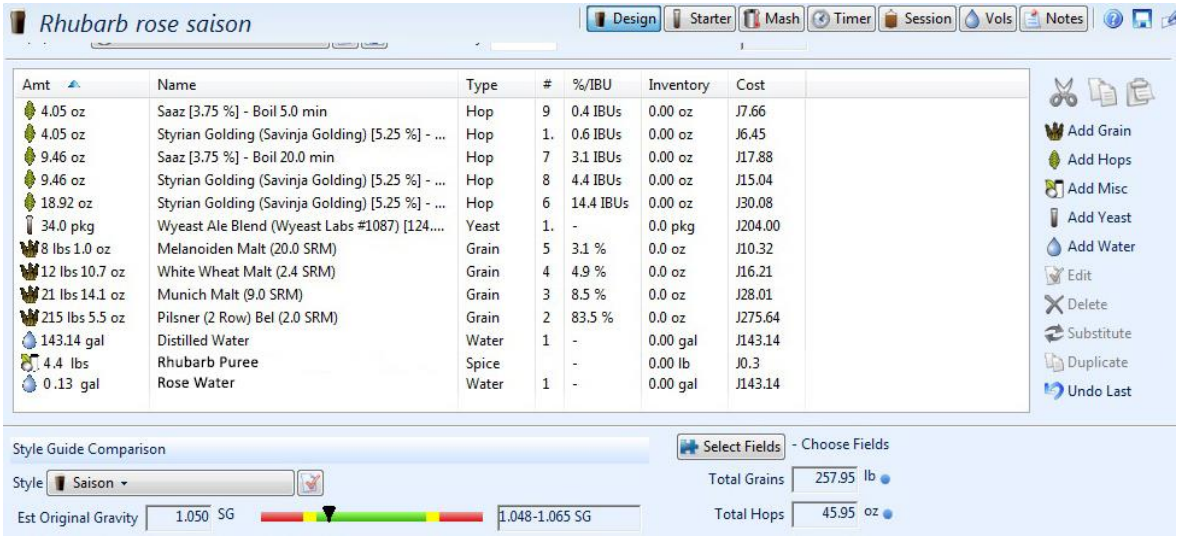

Figure 9. Recipe of rhubarb rose saison

Figure 9 depicts the recipe that contains the following ingredients: Saaz, Styrian Golding hops, Wyeast Ale Blend yeast, Melanoiden, white wheat, Munich, Pilsner malt, distilled water, rhubarb puree, rose water. At the end we get OG 1.046, ABV 4.7%, IBUs 23.0 and 151.6 kcal.

Figure 10. Bottle label. Corn roggenbier

In figure 10 we can see the bottle label which shows the night city view with some colourful rays. The slogan is "It will make your night". The purpose of such a label is to make our followers think that this beer is worth buying, because this purchase will make their night. Apart from the brand name, slogan, organic product sign we also can see the name of the beer style, ABV and quantity in the front label. The back label depicts also the brand name, beer style, ABV, quantity, ingredients and other necessary information on the beer such as OG, IBUs and kcal and the barcode. In figure 11 we can see the image of the bottle cork which has our

symbol on it. It is a rose crossed with the ear of wheat. The image reflects our main ingredients for the beer and beer additives. At the same time it looks simple and meaningful.

Figure 11. Bottle cork

Our statistical analysis showed that 35% of female respondents is highly interested in craft beer and 22% is extremely interested. The share of female respondents was 34%. It means that a lot of women drink craft beer too. Therefore, we developed two trial recipes for women and expect them to like it. Sweet and sour nature of banana HeFeWeizen and lightness of elderflower lime lager will attract the female segment. The other two beers we are going to brew for men. Corn roggenbier and rhubarb rose saison are more bitter and stronger in taste.

4.5 Financial statements

The financial statements consist of equipment cost calculation, supplies expense calculation, break even analysis, income statement and cash flow. We prepared the calculations above in order to analyse the profitability of our business, to know how much cash we will generate, to summarize our income and expenses, to maximize our use of cash and to find out how much we need to sell to breakeven.

We are planning to have two brews per week which gives us 1000 l and 3030 bottles. In order to establish the production for this scope we need a brewing system, cleaning equipment, bottling system, laboratory equipment, bottle washer, reusable bottles, office furniture, PC, software and a van. In total it will cost us 151200 euros. In table 2 we can see the total amount of

money needed and the sources of investment. Equipment cost or investment, insurance, licence, inventory, training of staff and rent deposit require 206150 euros before opening the brewery. We have two sources of financing which are share capital and bank loan. Equity is divided between 4 shareholders as it was mentioned above.

Table 2. "Need of money" calculation

Need of money	
Investments	151200
Insurance	4800
Licence	3150
Inventory	10000
Training of staff	27000
Rent deposit	10000
Total need of money	**206150**
Financed by	
Bank loan	150000
Equity	56150
Total financing	**206150**

We are taking bank loan for 10 years. Therefore, income statement and cash flow are done for 10 years two. They are represented in Appendix 6. Breakeven analysis shows that we need to sell 84359 units a year. It is 58% if price per bottle is 4 euros excluding VAT. We prepared income statement taking into consideration that we use 90% of our capacity. It gives us 139651 euros net income in the first year. Inflation is relatively 2% per year. Thus, we get 189941 euros net income in the tenth year.

Table 3. Cash flow for 10 years

Opening bank	5000	207908.1	368962.8	534708.6	705233.3	880626.4	1051779	1237186	1427740	1623539
Closing bank	207908	368963	534709	705233	880626	1051779	1237186	1427740	1623539	1824682

In table 3 we can see opening and closing bank for the upcoming 10 years. Deducting total payments from total receipts we get net cash flow. By adding it to opening bank we get the amount of cash on our bank account. In the first year it is 207908 euros. After 10 years we have 1824682 euros taking into consideration the fact that we need to do reinvestment in the 6th year. We are aiming to pay back our loan in 10 years. Therefore, the amount of cash we have at the end of the 10th year can be invested into further business development.

Discussion

The thesis represents our business plan for a craft brewery with the total production of about 4800 litres per year. We analysed the Finnish market and conducted the research on the beer preferences of our potential followers. Thereon we developed 4 beer recipes which fit the concept of the company and are supposed to meet our followers' expectations. At the start-up stage we have 4 beer styles infused with different beer additives which are not present in the Finnish beer market yet. Developing the recipes we also took into consideration gender preferences. Working on the concept of the business we also considered distribution channels. Thereon we found suppliers Alko and Metrotukku, which operate in the city of Helsinki and sell alcoholic beverages to restaurants, hotels etc. and directly to consumers.

As the result of our market analysis we found out that both men and women are highly interested in craft beer. They are either citizens or visitors of Helsinki who purchase beer in supermarkets or restaurants, bars etc. The most popular beer styles are German and Check lager and Belgian ale. Due to the fact that 57% of women expressed their interest in craft beer we developed two beer recipes which they might like. They are banana HeFeWeizen and elderflower lime lager. The other two beer styles are more manlike, bitter and intensive in taste. They are corn roggenbier and rhubarb rose saison.

The financial plans we prepared show that the business is going to be profitable. F&F Brew Co. is planning to sell 145000 bottles annually and receive 139651 euros net income in the first year. All net profit will be invested into further development of the business. The company will need manpower. We are planning to open 2 vacancies with the salary of 3500 plus bonuses.

We are planning to use this business plan to achieve our business objectives in starting up our own brewery in the nearest future.

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Appendices

Appendix 1. The lease of the premises

LIIKEHUONEISTON VUOKRASOPIMUS

Vuokranantaja

Nimi | Pankkiyhteys

Lähiosoite | Postinro | Postitoimipaikka | Puhelin/telefax

Vuokralainen

Nimi | Y- tai henkilötunnus

Lähiosoite | Postinro | Postitoimipaikka | Puhelin/telefax

Vuokrauksen kohde

Lähiosoite | Postinro | Postitoimipaikka

Vuokrattavat tilat | Pinta-ala noin m²

Käyttötarkoitus

Vuokra-aika

1. ☐ Toistaiseksi voimassa | 2. ☐ Määräaikainen

Alkamispäivä | Irtisanomisaika | Alkamispäivä | Päättymispäivä

Määräaikainen vuokrasopimus päättyy ilman irtisanomista sovittuna päättymispäivänä. Mikäli osapuolet kuitenkin haluavat sopia vuokrasopimuksen jatkamisesta eivät sovitun vuokrakauden päätyttyä, sopimus jatkuu _____ kuukautta/vuotta kerrallaan, ellei sen päättymisestä ilmoiteta kuukautta ennen kunkin vuokrakauden päättymistä.
Osapuolet voivat myös sopia, että sopimus jatkuu määräaikaisen vuokrakauden päätyttyä toistaiseksi, jossa tapauksessa irtisanomisaika on _____ kuukautta.
Sopimuksen jatkamisesta eivät sovitun vuokrakauden päätyttyä on ilmoitettava _____ kuukautta ennen vuokrakauden päättymistä.

Vuokra

Euro/kk | Euro/m² | Vuokranmaksukausi ☐ Kalenterikuukausi ☐

Eräpäivä ☐ LHVLn mukainen | Viivästyskorko ☐ Korkolain mukainen ☐ %

Vuokralainen maksaa vuokranmaksua | Ennakon määrä

Ennakon maksupäivä | Ennakko hyvitetään ☐ Viimeisistä vuokrista ☐

Vakuus

Tämän sopimuksen velvoitusten täyttämisen vakuudeksi vuokralainen toimittaa vuokranantajalle vakuuden.
☐

Vakuus ja sen arvo | Vakuuden toimituspäivä

Vuokranantajalla on oikeus muuttaa vakuudeksi annettu esine rahaksi vakuuden antajaa kuulematta parhaaksi katsomallaan tavalla.

Vuokran korottaminen

Vuokra sidotaan ☐ Elinkustannusindeksiin ☐

Allekirjoitukset

Olemme tutustuneet tämän lomakkeen ehtoihin ja sitoudumme noudattamaan niitä.
Tänä sopimusta ja sen liitteitä on laadittu kaksi yhtäpitävää kappaletta.
Mahdollisista muista ehdoista on sovittu eri liitteessä.

Paikka ja aika

Vuokranantajan allekirjoitus ja nimen selvennys | Vuokralaisen allekirjoitus ja nimen selvennys

Allekirjoitukset molempiin kappaleisiin erikseen.

Alkuperäinen kelluty

Appendix 2. Memorandum of association

THE BUSINESS INFORMATION SYSTEM

For official use

/

START-UP NOTIFICATION

Limited companies, co-operatives, savings banks, foundations, associations and other organisations

Y1

This form is for having your enterprise entered in the Trade Register, Foundation Register, VAT Register, Prepayment Register, Employer Register and the Register of payers of tax on insurance premiums.

Please, send the completed form to: PRH - Verohallinto, Yritystietojärjestelmä, PL 2000, 00231 HELSINKI

YTJ 10011

Name of enterprise or organisation	
Company Name (treated as a suggested name until the Trade Register has approved it)	Language ☐ Finnish ☐ Swedish
Alternative Company Name 2	Alternative Company Name 3
Requesting registration in (complete pp. 3–4 to give details to the Tax Administration)	
☐ The Trade Register (enclose receipt proving you paid the fee)	☐ Register of Foundations

Trade register: Accelerated processing request (does not apply to changes of addresses and contact details).
We normally process the completed application forms on a first come, first served basis. **Exceptions can only be made for a valid reason.** Requests for accelerated processing cannot always be granted.

☐ Tick this box if you are asking for registration by a desired date. **Note:** enclose a separate letter to give your reasons for this.

Domicile	
Municipality	Country of residence (if not Finland)

Other company names (fill in if needed)	
Parallel names (translations of the company name into foreign languages)	
Auxiliary Name	Description of activities under this Auxiliary Name
Auxiliary Name	Description of activities under this Auxiliary Name

Address information for public use at PRH and the Finnish Tax Administration (postal or street address is mandatory)						
Postal address (street or road)	Building no	Entrance no	Apartment no	PO Box no	Postal code	Town or City
Street address (street or road)	Building no	Entrance no	Apartment no		Postal code	Town or City
e-mail	Telephone				Website	

The accounting period begins on the day the company is established, or the day when business in Finland is started (foreign companies). If you conducted business prior to the date or if you are registering an Association, see the guidance for completing this form.			
	dd.mm.yyyy		dd.mm.yyyy
Date of establishment or start date of business in Finland		End date of the first accounting period (max. 18 months)	

The next accounting period (length = one year) starts automatically after the first.

Y1

☐ The company is to continue the trade or business of the previous company (e.g. a private trader becomes a limited partnership), see instructions. Complete the Personal Data Form.

Name of the previous company	Business ID

Main sector (line of business) to be declared to Tax Administration (five-digit TOL 2008 code. For more information, visit website of Statistics Finland.)

Type of enterprise (Please complete the mandatory appendix form applicable to your enterprise)

☐ Limited company (private limited company)
☐ Co-operative
☐ Branch of a foreign enterprise
☐ Housing company
☐ Foundation
☐ Foreign company
☐ Public limited company
☐ Association _____ Register of Associations no.
☐ Other type, please specify _____

Enclosures: select at least one, as appropriate for your legal entity form

YTJ 10012

☐ 1 **Limited company or public limited company**
☐ 1B **Housing company or insurance company or public insurance company**
☐ 2 **Cooperative or cooperative bank**
☐ 3 **Branch of a foreign enterprise**
☐ 4 **Mutual insurance company, public mutual insurance company or insurance association**
☐ 5 **Right-of-occupancy association, resident administered area, European economic interest grouping or branch of an interest grouping located in Finland but registered in another country, mortgage society savings bank or state public enterprise**
☐ 11A **Foundation (under Act 487/2015 on Foundations)**
☐ 12 **Association**

Enclosures for the Tax Administration

☐ 6204 **Registration of a foreign enterprise**
☐ 6208 **Registration of a real estate company; Registration of a housing company**

Who can provide further information about this notification; an individual, an accounting firm etc.?

Name		
Postal address	Postal code	Town or City
Telephone	e-mail	

Date and signature

Date	Signature and printed name	Telephone

For a legal statement regarding the use of stored personal data, as required by §24, Personal Data Act, visit ytj.fi or contact the National Board of Patents and Registration / Tax Administration.

INFORMATION FOR THE TAX ADMINISTRATION

Y1

Postal address to be given to the Tax Administration use only (unless it is the same as on Page 1)

Postal address (street or road)	Building no	Entrance no	Apartment no	PO Box no	Postal code	Town or City

YTJ 10013

Registration for VAT	as of (dd.mm.yyyy)	**Exclusion from VAT** (please attach a statement of the grounds)	as of (dd.mm.yyyy)

- ☐ Trade or business
- ☐ Purchases; withdrawal of goods for own use
- ☐ Notification obligation for sales of services in the EU
- ☐ Primary producer

VAT taxpayer status is requested	as of (dd.mm.yyyy)

- ☐ For the transfer of rights to use immovable property (under §12 and §30, VAT Act. Rental contract - or other account of the rental property and tenant - must be enclosed.)
- ☐ Small-scale business operator (§3, VAT Act, €10,000)
- ☐ For intra-Community acquisitions (§26 f, VAT Act)
- ☐ Primary producer
- ☐ Non-profit/religious entity (§12.1, VAT Act)

Justification that the company does not consider itself liable for VAT

- ☐ Small-scale business (§3, VAT Act, €10,000)
- ☐ Healthcare services (§34, VAT Act)
- ☐ Social services (§37, VAT Act)
- ☐ Instructor services (§39, VAT Act)
- ☐ Financial and insurance services (§41, §44, VAT Act)
- ☐ Non-profit/religious entity (§4-5, VAT Act)
- ☐ Fees to performing artist or royalties (§45, VAT Act)
- ☐ Real property right (§27, VAT Act)
- ☐ Other non-VAT operations, please specify:

_____

Requesting entry in the Prepayment Register (§25, Prepayment Act) (Earliest possible date of registration is the date of arrival of the completed form.)	as of (dd.mm.yyyy)
Registering as an employer paying wages on a regular basis	as of (dd.mm.yyyy)

Tax period of self assessed taxes

If turnover (=net sales) does not exceed €100,000 per year, you have the option to report and pay VAT, payroll withholding, employer's social security and source tax in quarter-year periods. If it does not exceed €30,000, VAT can be filed and paid by calendar year, and other self-assessed taxes quarterly. Please note that 'turnover' also includes the company's foreign selling.

- ☐ Sales for calendar year is €30,000 max.
- ☐ Sales for calendar year is from €30,001 to €100,000
- ☐ Sales for calendar year is higher than €100,000

Desired length of tax period – VAT

- ☐ year
- ☐ quarterly
- ☐ monthly

Desired length of tax period – employer contributions

- ☐ quarterly
- ☐ monthly

The Tax Administration will decide on the length of the period and inform you in writing.

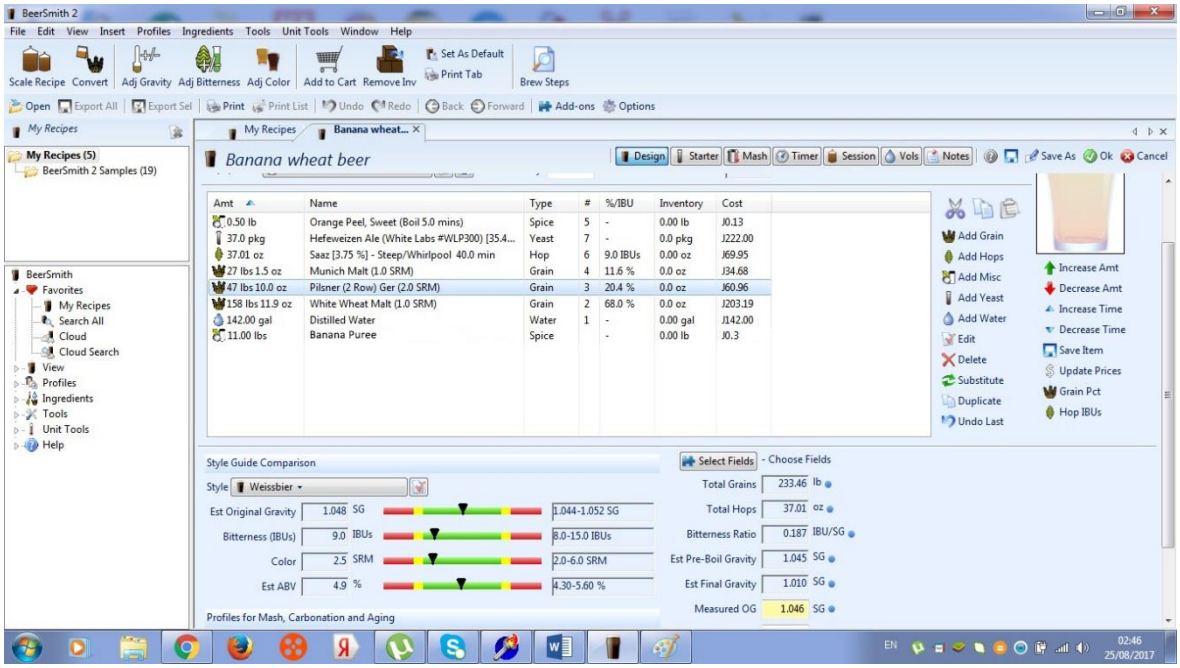
Y1

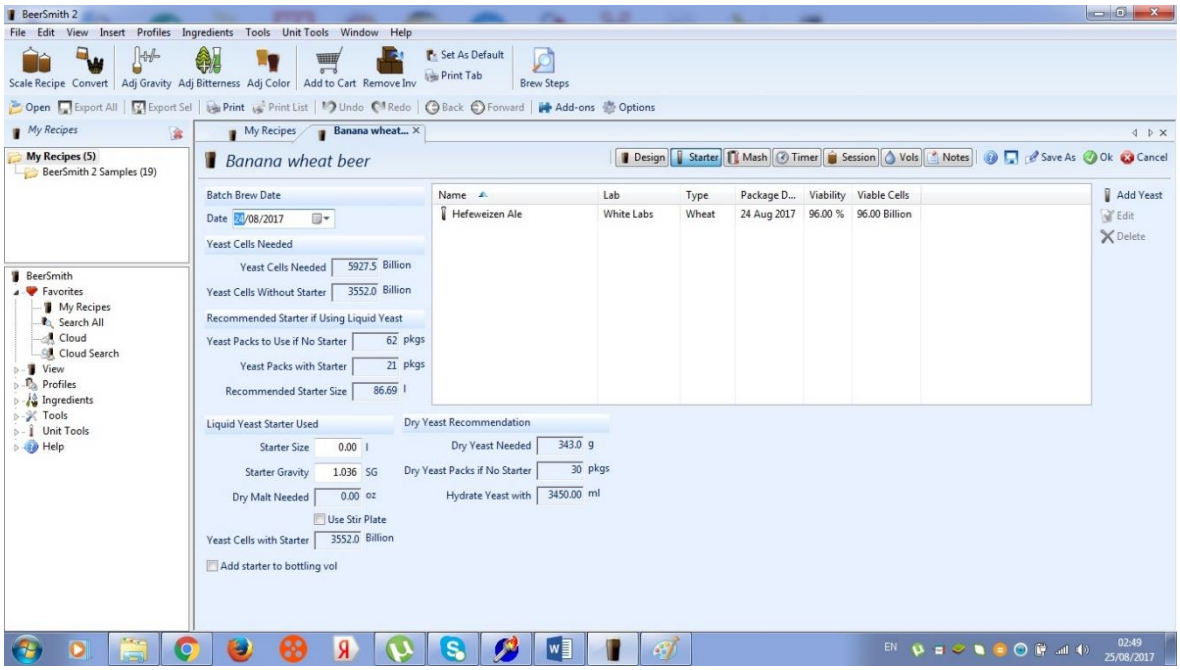
Registrering as liable to pay tax on insurance premiums	as of (dd.mm.yyyy)

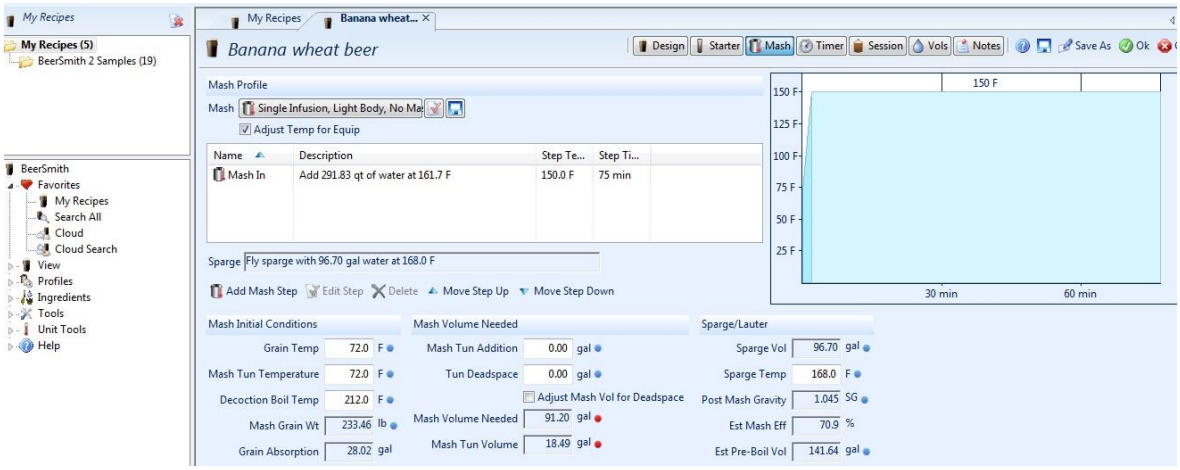
YTJ 10014

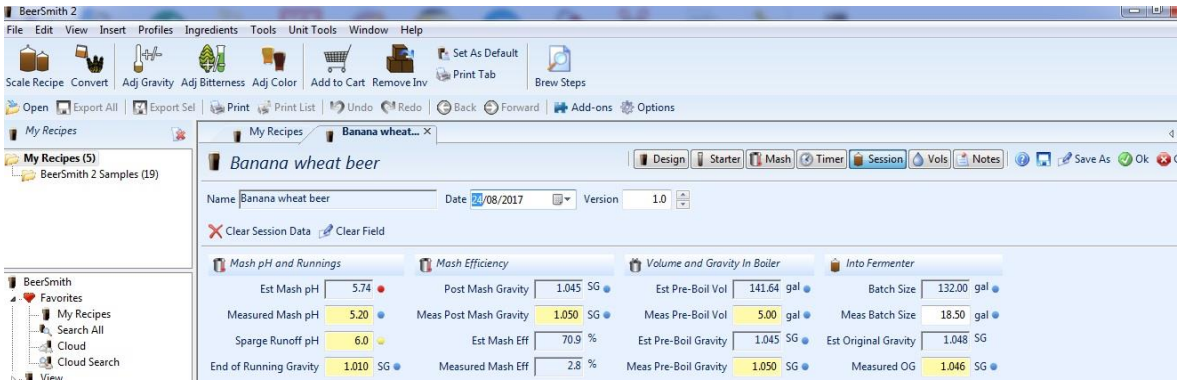
Additional information

Appendix 3. Recipe development in BeerSmith software.






My Recipes
My Recipes (5)
BeerSmith 2 Samples (19)
Banana wheat beer
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Mash Profile
Mash
Single Infusion, Light Body, No Ma
Adjust Temp for Equip
Name
Description
Step Te...
Step Ti...
Mash In
Add 291.83 qt of water at 161.7 F
150.0 F
75 min
Sparge
Fly sparge with 96.70 gal water at 168.0 F
Add Mash Step
Edit Step
Delete
Move Step Up
Move Step Down
150 F
125 F
100 F
75 F
50 F
25 F
30 min
60 min
Mash Initial Conditions
Grain Temp 72.0 F
Mash Tun Temperature 72.0 F
Decoction Boil Temp 212.0 F
Mash Grain Wt 233.46 lb
Grain Absorption 28.02 gal
Mash Volume Needed
Mash Tun Addition 0.00 gal
Tun Deadspace 0.00 gal
Adjust Mash Vol for Deadspace
Mash Volume Needed 91.20 gal
Mash Tun Volume 18.49 gal
Sparge/Lauter
Sparge Vol 96.70 gal
Sparge Temp 168.0 F
Post Mash Gravity 1.045 SG
Est Mash Eff 70.9 %
Est Pre-Boil Vol 141.64 gal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File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
Scale Recipe
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Adj Bitterness
Adj Color
Add to Cart
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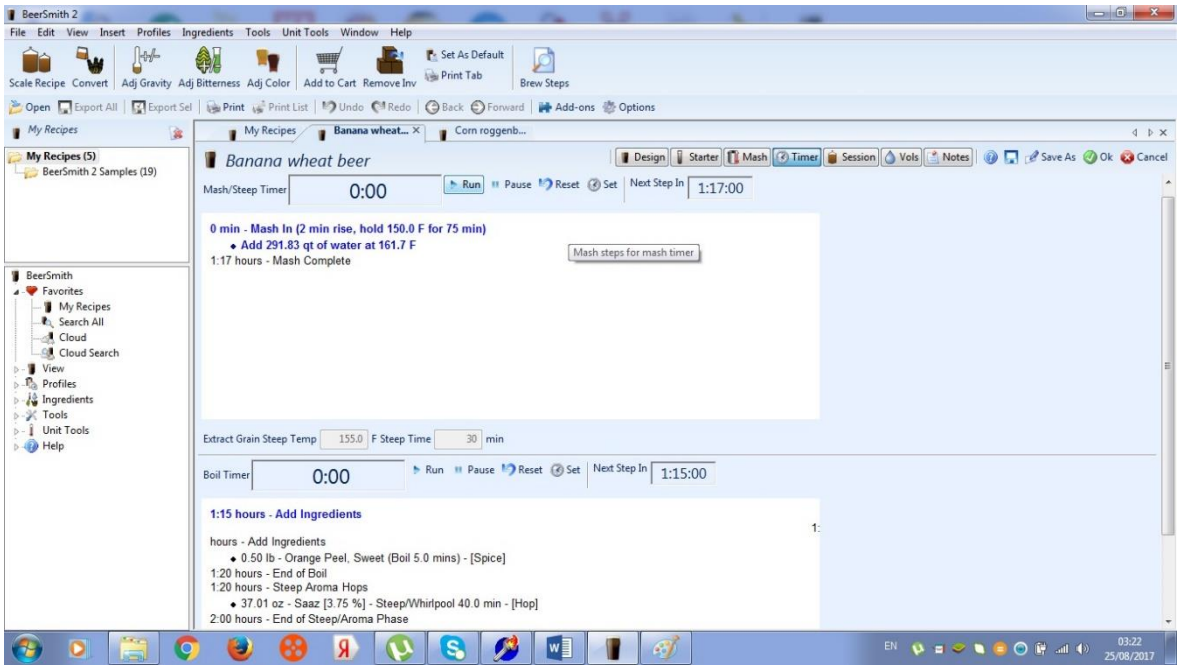
Add-ons
Options
My Recipes
My Recipes (5)
BeerSmith 2 Samples (19)
Banana wheat beer
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Name
Banana wheat beer
Date
24/08/2017
Version
1.0
Clear Session Data
Clear Field
Mash pH and Runnings
Est Mash pH 5.74
Measured Mash pH 5.20
Sparge Runoff pH 6.0
End of Running Gravity 1.010 SG
Mash Efficiency
Post Mash Gravity 1.045 SG
Meas Post Mash Gravity 1.050 SG
Est Mash Eff 70.9 %
Measured Mash Eff 2.8 %
Volume and Gravity In Boiler
Est Pre-Boil Vol 141.64 gal
Meas Pre-Boil Vol 5.00 gal
Est Pre-Boil Gravity 1.045 SG
Meas Pre-Boil Gravity 1.050 SG
Into Fermenter
Batch Size 132.00 gal
Meas Batch Size 18.50 gal
Est Original Gravity 1.048 SG
Measured OG 1.046 SG


BeerSmith 2
File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
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Brew Steps
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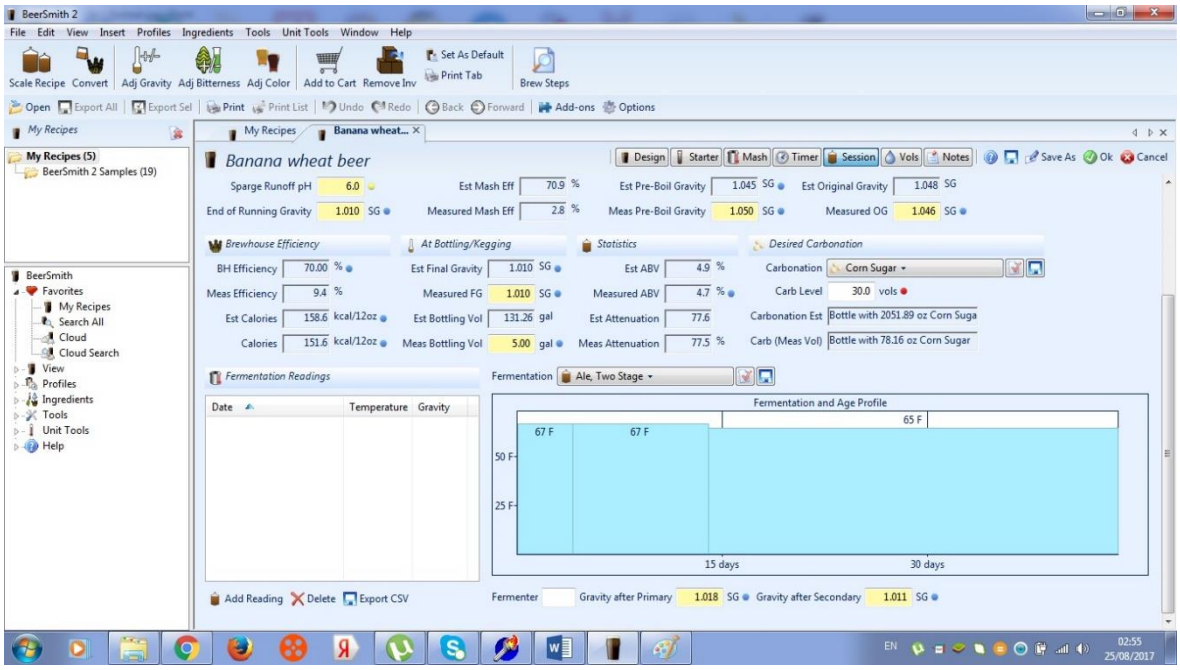
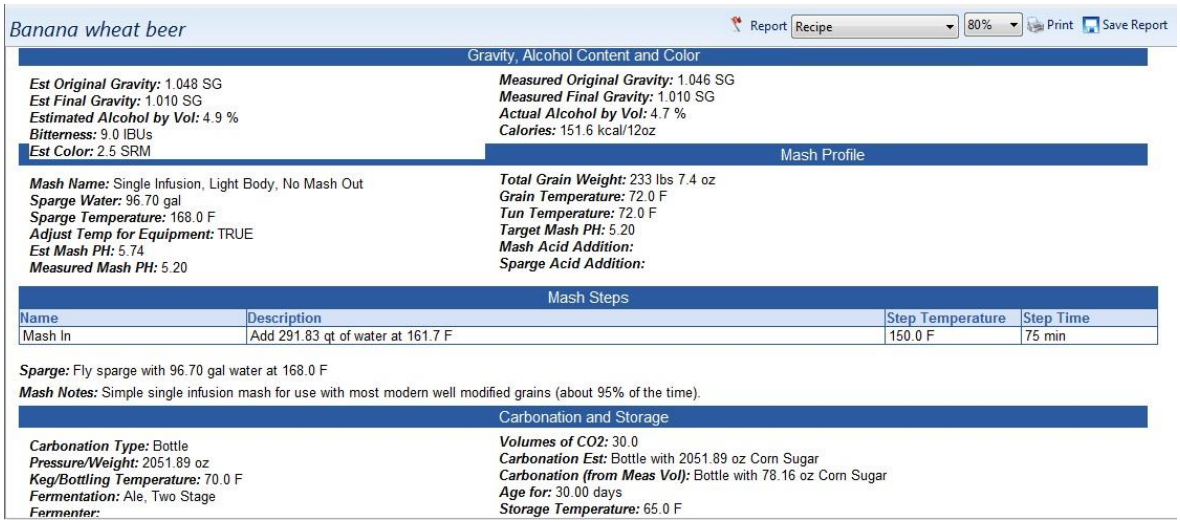
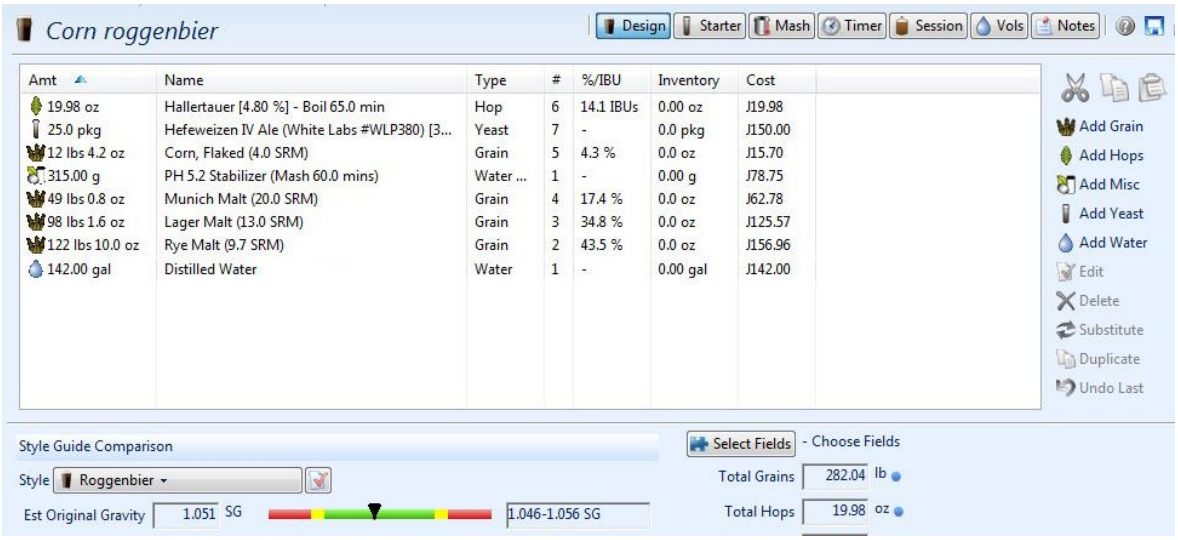
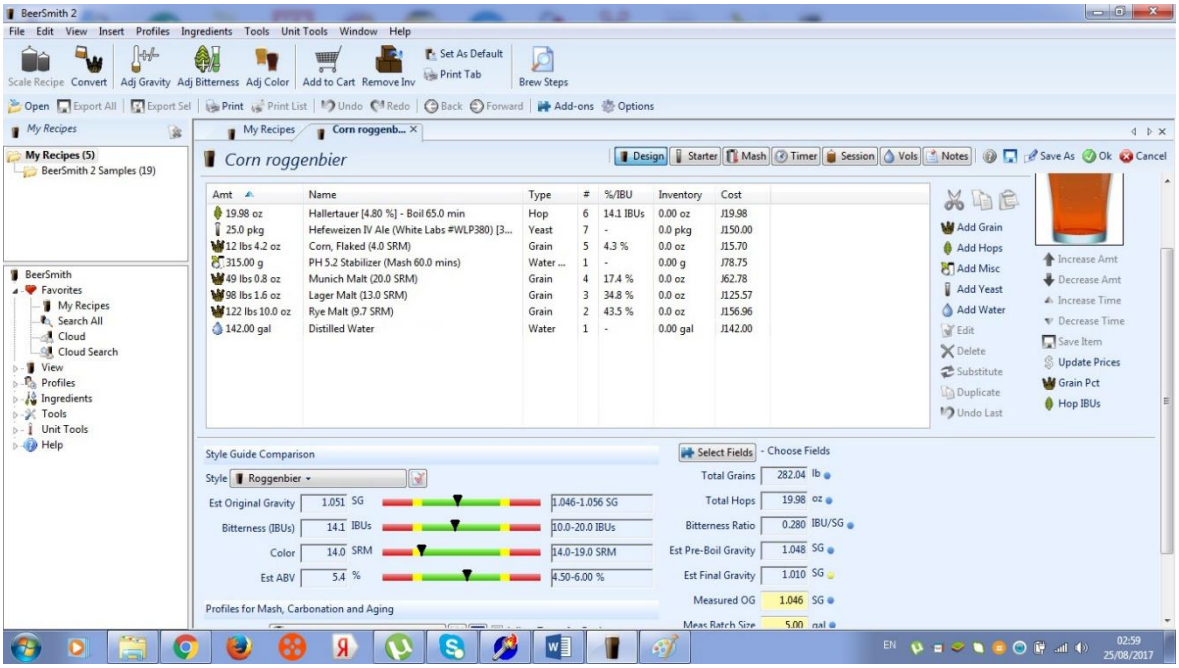
Add-ons
Options
My Recipes
My Recipes (5)
BeerSmith 2 Samples (19)
Banana wheat beer
Corn roggenb...
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Cancel
Mash/Steep Timer
0:00
Run
Pause
Reset
Set
Next Step In
1:17:00
0 min - Mash In (2 min rise, hold 150.0 F for 75 min)
Add 291.83 qt of water at 161.7 F
1:17 hours - Mash Complete
Mash steps for mash timer
Extract Grain Steep Temp
155.0
F Steep Time
30
min
Boil Timer
0:00
Run
Pause
Reset
Set
Next Step In
1:15:00
1:15 hours - Add Ingredients
hours - Add Ingredients
0.50 lb - Orange Peel, Sweet (Boil 5.0 mins) - [Spice]
1:20 hours - End of Boil
1:20 hours - Steep Aroma Hops
37.01 oz - Saaz [3.75 %] - Steep/Whirlpool 40.0 min - [Hop]
2:00 hours - End of Steep/Aroma Phase
EN
03:22
25/08/2017


BeerSmith 2
File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
Scale Recipe Convert Adj Gravity Adj Bitterness Adj Color Add to Cart Remove Inv Set As Default Print Tab Brew Steps
Open Export All Export Sel Print Print List Undo Redo Back Forward Add-ons Options
My Recipes
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
My Recipes
Banana wheat...
Banana wheat beer
Design Starter Mash Timer Session Vols Notes Save As Ok Cancel
Sparge Runoff pH 6.0
Est Mash Eff 70.9 %
Est Pre-Boil Gravity 1.045 SG
Est Original Gravity 1.048 SG
End of Running Gravity 1.010 SG
Measured Mash Eff 2.8 %
Meas Pre-Boil Gravity 1.050 SG
Measured OG 1.046 SG
Brewhouse Efficiency
BH Efficiency 70.00 %
Meas Efficiency 9.4 %
Est Calories 158.6 kcal/12oz
Calories 151.6 kcal/12oz
At Bottling/Kegging
Est Final Gravity 1.010 SG
Measured FG 1.010 SG
Est Bottling Vol 131.26 gal
Meas Bottling Vol 5.00 gal
Statistics
Est ABV 4.9 %
Measured ABV 4.7 %
Est Attenuation 77.6
Meas Attenuation 77.5 %
Desired Carbonation
Carbonation Corn Sugar
Carb Level 30.0 vols
Carbonation Est Bottle with 2051.89 oz Corn Suga
Carb (Meas Vol) Bottle with 78.16 oz Corn Sugar
Fermentation Readings
Date Temperature Gravity
Add Reading Delete Export CSV
Fermentation Ale, Two Stage
Fermentation and Age Profile
67 F
67 F
65 F
50 F
25 F
15 days
30 days
Fermenter
Gravity after Primary 1.018 SG
Gravity after Secondary 1.011 SG
EN 02:55 25/08/2017


Banana wheat beer
Report Recipe 80% Print Save Report
Banana wheat beer
Weissbier (10 A)
Type: All Grain
Batch Size: 132.00 gal
Boil Size: 141.64 gal
Boil Time: 80 min
End of Boil Vol: 139.24 gal
Final Bottling Vol: 131.26 gal
Fermentation: Ale, Two Stage
Taste Notes:
Date: 24 Aug 2017
Brewer:
Asst Brewer:
Equipment: Pot (18.5 Gal/70 L) - BIAB
Efficiency: 70.00 %
Est Mash Efficiency: 70.9 %
Taste Rating: 30.0
Ingredients
Amt Name Type # %/IBU
142.00 gal Distilled Water Water 1 -
158 lbs 11.9 oz White Wheat Malt (1.0 SRM) Grain 2 68.0 %
47 lbs 10.0 oz Pilsner (2 Row) Ger (2.0 SRM) Grain 3 20.4 %
27 lbs 1.5 oz Munich Malt (1.0 SRM) Grain 4 11.6 %
0.50 lb Orange Peel, Sweet (Boil 5.0 mins) Spice 5 -
37.01 oz Saaz [3.75 %] - Steep/Whirlpool 40.0 min Hop 6 9.0 IBUs
37.0 pkg Hefeweizen Ale (White Labs #WLP300) [35.49 ml] Yeast 7 -


Banana wheat beer
Report Recipe 80% Print Save Report
Gravity, Alcohol Content and Color
Est Original Gravity: 1.048 SG
Est Final Gravity: 1.010 SG
Estimated Alcohol by Vol: 4.9 %
Bitterness: 9.0 IBUs
Est Color: 2.5 SRM
Measured Original Gravity: 1.046 SG
Measured Final Gravity: 1.010 SG
Actual Alcohol by Vol: 4.7 %
Calories: 151.6 kcal/12oz
Mash Profile
Mash Name: Single Infusion, Light Body, No Mash Out
Sparge Water: 96.70 gal
Sparge Temperature: 168.0 F
Adjust Temp for Equipment: TRUE
Est Mash PH: 5.74
Measured Mash PH: 5.20
Total Grain Weight: 233 lbs 7.4 oz
Grain Temperature: 72.0 F
Tun Temperature: 72.0 F
Target Mash PH: 5.20
Mash Acid Addition:
Sparge Acid Addition:
Mash Steps
Name Description Step Temperature Step Time
Mash In Add 291.83 qt of water at 161.7 F 150.0 F 75 min
Sparge: Fly sparge with 96.70 gal water at 168.0 F
Mash Notes: Simple single infusion mash for use with most modern well modified grains (about 95% of the time).
Carbonation and Storage
Carbonation Type: Bottle
Pressure/Weight: 2051.89 oz
Keg/Bottling Temperature: 70.0 F
Fermentation: Ale, Two Stage
Fermenter:
Volumes of CO2: 30.0
Carbonation Est: Bottle with 2051.89 oz Corn Sugar
Carbonation (from Meas Vol): Bottle with 78.16 oz Corn Sugar
Age for: 30.00 days
Storage Temperature: 65.0 F


Corn roggenbier
Design
Starter
Mash
Timer
Session
Vols
Notes
Amt
Name
Type
#
%/IBU
Inventory
Cost
19.98 oz
Hallertauer [4.80 %] - Boil 65.0 min
Hop
6
14.1 IBUs
0.00 oz
J19.98
25.0 pkg
Hefeweizen IV Ale (White Labs #WLP380) [3...
Yeast
7
-
0.0 pkg
J150.00
12 lbs 4.2 oz
Corn, Flaked (4.0 SRM)
Grain
5
4.3 %
0.0 oz
J15.70
315.00 g
PH 5.2 Stabilizer (Mash 60.0 mins)
Water ...
1
-
0.00 g
J78.75
49 lbs 0.8 oz
Munich Malt (20.0 SRM)
Grain
4
17.4 %
0.0 oz
J62.78
98 lbs 1.6 oz
Lager Malt (13.0 SRM)
Grain
3
34.8 %
0.0 oz
J125.57
122 lbs 10.0 oz
Rye Malt (9.7 SRM)
Grain
2
43.5 %
0.0 oz
J156.96
142.00 gal
Distilled Water
Water
1
-
0.00 gal
J142.00
Add Grain
Add Hops
Add Misc
Add Yeast
Add Water
Edit
Delete
Substitute
Duplicate
Undo Last
Style Guide Comparison
Style
Roggenbier
Est Original Gravity
1.051
SG
1.046-1.056 SG
Select Fields
- Choose Fields
Total Grains
282.04
lb
Total Hops
19.98
oz


BeerSmith 2
File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
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Adj Gravity
Adj Bitterness
Adj Color
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Set As Default
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Corn roggenb...
Corn roggenbier
Design
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Mash
Timer
Session
Vols
Notes
Save As
Ok
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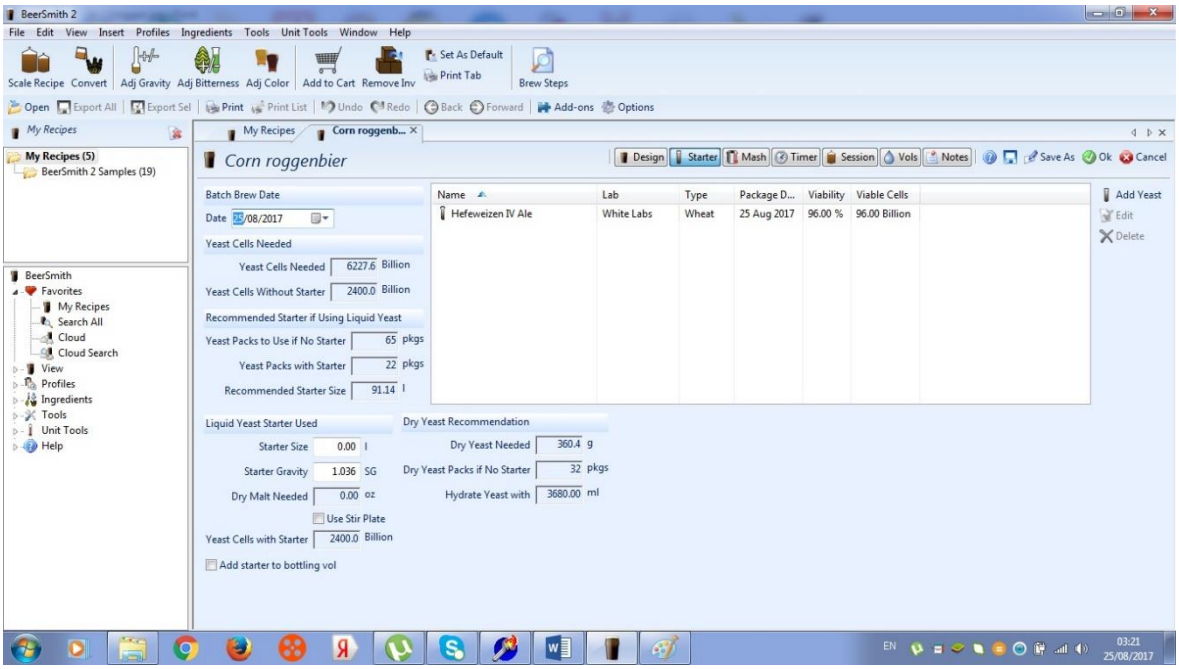
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
Amt
Name
Type
#
%/IBU
Inventory
Cost
19.98 oz
Hallertauer [4.80 %] - Boil 65.0 min
Hop
6
14.1 IBUs
0.00 oz
J19.98
25.0 pkg
Hefeweizen IV Ale (White Labs #WLP380) [3...
Yeast
7
-
0.0 pkg
J150.00
12 lbs 4.2 oz
Corn, Flaked (4.0 SRM)
Grain
5
4.3 %
0.0 oz
J15.70
315.00 g
PH 5.2 Stabilizer (Mash 60.0 mins)
Water ...
1
-
0.00 g
J78.75
49 lbs 0.8 oz
Munich Malt (20.0 SRM)
Grain
4
17.4 %
0.0 oz
J62.78
98 lbs 1.6 oz
Lager Malt (13.0 SRM)
Grain
3
34.8 %
0.0 oz
J125.57
122 lbs 10.0 oz
Rye Malt (9.7 SRM)
Grain
2
43.5 %
0.0 oz
J156.96
142.00 gal
Distilled Water
Water
1
-
0.00 gal
J142.00
Add Grain
Add Hops
Add Misc
Add Yeast
Add Water
Edit
Delete
Substitute
Duplicate
Undo Last
Increase Amt
Decrease Amt
Increase Time
Decrease Time
Save Item
Update Prices
Grain Pct
Hop IBUs
Style Guide Comparison
Style
Roggenbier
Est Original Gravity
1.051
SG
1.046-1.056 SG
Bitterness (IBUs)
14.1
IBUs
10.0-20.0 IBUs
Color
14.0
SRM
14.0-19.0 SRM
Est ABV
5.4
%
4.50-6.00 %
Select Fields
- Choose Fields
Total Grains
282.04
lb
Total Hops
19.98
oz
Bitterness Ratio
0.280
IBU/SG
Est Pre-Boil Gravity
1.048
SG
Est Final Gravity
1.010
SG
Measured OG
1.046
SG
Profiles for Mash, Carbonation and Aging
EN
02:59
25/08/2017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File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
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Adj Bitterness
Adj Color
Add to Cart
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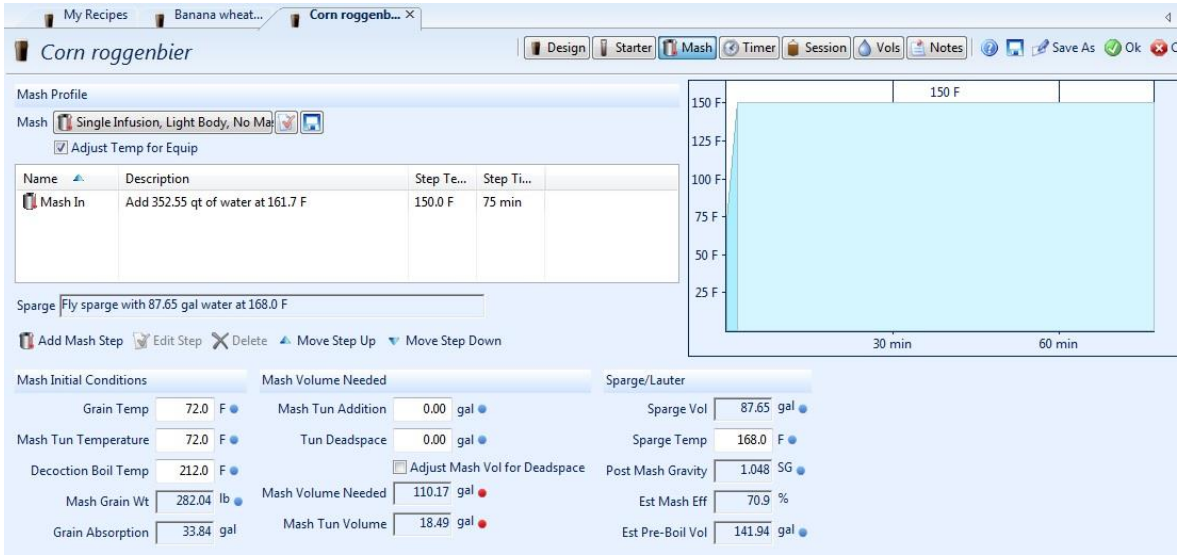
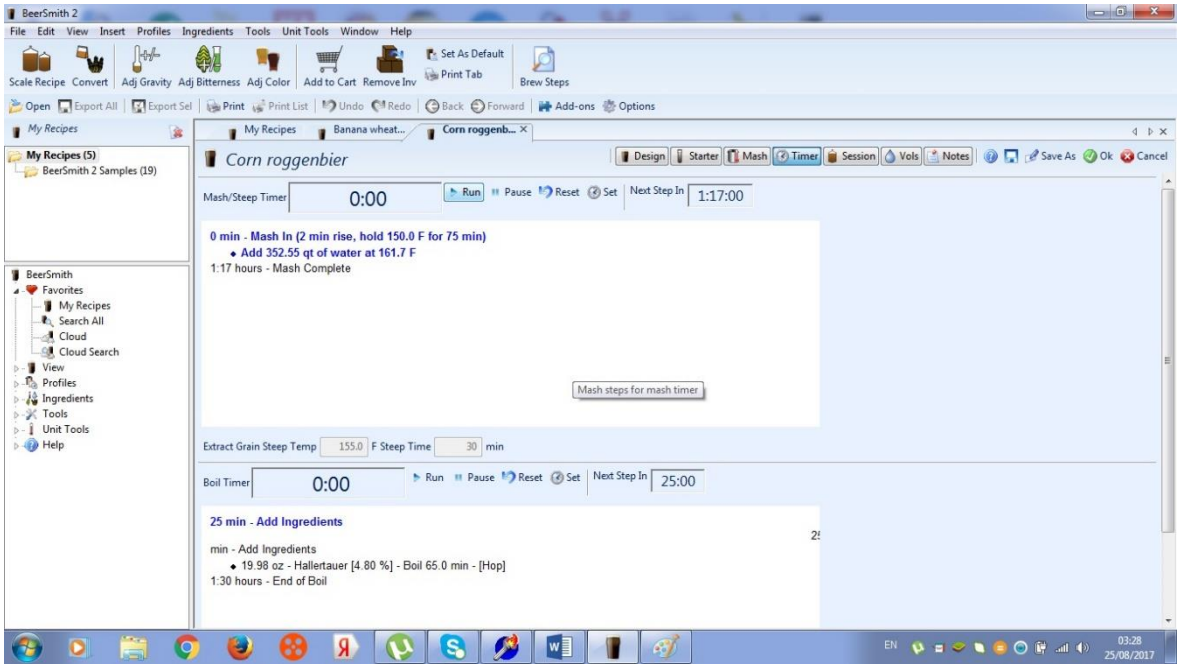
Add-ons
Options
My Recipes
Corn roggenb...
Corn roggenbier
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Cancel
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
Batch Brew Date
Date
25/08/2017
Yeast Cells Needed
Yeast Cells Needed
6227.6
Billion
Yeast Cells Without Starter
2400.0
Billion
Recommended Starter if Using Liquid Yeast
Yeast Packs to Use if No Starter
65
pkgs
Yeast Packs with Starter
22
pkgs
Recommended Starter Size
91.14
l
Name
Lab
Type
Package D...
Viability
Viable Cells
Hefeweizen IV Ale
White Labs
Wheat
25 Aug 2017
96.00 %
96.00 Billion
Add Yeast
Edit
Delete
Liquid Yeast Starter Used
Starter Size
0.00
l
Starter Gravity
1.036
SG
Dry Malt Needed
0.00
oz
Use Stir Plate
Yeast Cells with Starter
2400.0
Billion
Add starter to bottling vol
Dry Yeast Recommendation
Dry Yeast Needed
360.4
g
Dry Yeast Packs if No Starter
32
pkgs
Hydrate Yeast with
3680.00
ml
EN
03:21
25/08/2017


My Recipes
Banana wheat...
Corn roggenb...
Corn roggenbier
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Mash Profile
Mash
Single Infusion, Light Body, No Ma
Adjust Temp for Equip
Name
Description
Step Te...
Step Ti...
Mash In
Add 352.55 qt of water at 161.7 F
150.0 F
75 min
150 F
125 F
100 F
75 F
50 F
25 F
30 min
60 min
Sparge
Fly sparge with 87.65 gal water at 168.0 F
Add Mash Step
Edit Step
Delete
Move Step Up
Move Step Down
Mash Initial Conditions
Grain Temp 72.0 F
Mash Tun Temperature 72.0 F
Decoction Boil Temp 212.0 F
Mash Grain Wt 282.04 lb
Grain Absorption 33.84 gal
Mash Volume Needed
Mash Tun Addition 0.00 gal
Tun Deadspace 0.00 gal
Adjust Mash Vol for Deadspace
Mash Volume Needed 110.17 gal
Mash Tun Volume 18.49 gal
Sparge/Lauter
Sparge Vol 87.65 gal
Sparge Temp 168.0 F
Post Mash Gravity 1.048 SG
Est Mash Eff 70.9 %
Est Pre-Boil Vol 141.94 gal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Adj Bitterness
Adj Color
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Add-ons
Options
My Recipes
Banana wheat...
Corn roggenb...
Corn roggenbier
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Cancel
My Recipes (5)
BeerSmith 2 Samples (19)
Mash/Steep Timer
0:00
Run
Pause
Reset
Set
Next Step In
1:17:00
0 min - Mash In (2 min rise, hold 150.0 F for 75 min)
Add 352.55 qt of water at 161.7 F
1:17 hours - Mash Complete
Mash steps for mash timer
Extract Grain Steep Temp
155.0
F Steep Time
30
min
Boil Timer
0:00
Next Step In
25:00
25 min - Add Ingredients
min - Add Ingredients
19.98 oz - Hallertauer [4.80 %] - Boil 65.0 min - [Hop]
1:30 hours - End of Boil
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
EN
03:28
25/08/2017


BeerSmith 2
File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
Scale Recipe
Convert
Adj Gravity
Adj Bitterness
Adj Color
Add to Cart
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Add-ons
Options
My Recipes
Banana wheat...
Corn roggenb...
Corn roggenbier
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
My Recipes (5)
BeerSmith 2 Samples (19)
Name
Corn roggenbier
Date
25/08/2017
Version
1.0
Clear Session Data
Clear Field
Mash pH and Runnings
Est Mash pH 5.39
Measured Mash pH 5.20
Sparge Runoff pH 6.0
End of Running Gravity 1.010 SG
Mash Efficiency
Post Mash Gravity 1.048 SG
Meas Post Mash Gravity 1.050 SG
Est Mash Eff 70.9 %
Measured Mash Eff 2.6 %
Volume and Gravity In Boiler
Est Pre-Boil Vol 141.94 gal
Meas Pre-Boil Vol 5.00 gal
Est Pre-Boil Gravity 1.048 SG
Meas Pre-Boil Gravity 1.050 SG
Into Fermenter
Batch Size 132.00 gal
Meas Batch Size 5.00 gal
Est Original Gravity 1.051 SG
Measured OG 1.046 SG
BeerSmith
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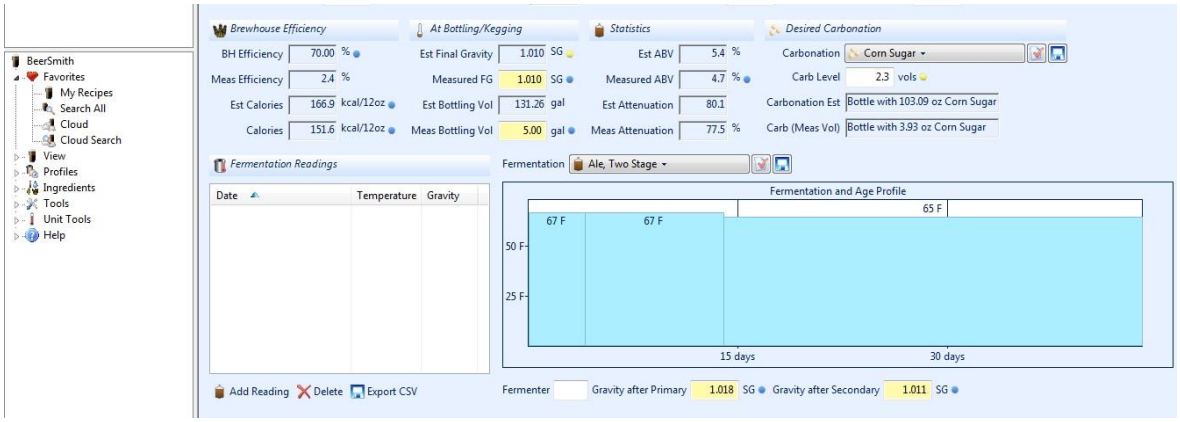
My Recipes
Search All
Cloud
Cloud Search
View



Corn roggenbier

Roggenbier (27)

Type: All Grain
Batch Size: 132.00 gal
Boil Size: 141.94 gal
Boil Time: 90 min
End of Boil Vol: 139.24 gal
Final Bottling Vol: 131.26 gal
Fermentation: Ale, Two Stage

Date: 25 Aug 2017
Brewer:
Asst Brewer:
Equipment: Pot (18.5 Gal/70 L) - BIAB
Efficiency: 70.00 %
Est Mash Efficiency: 70.9 %
Taste Rating: 30.0

Taste Notes:

Ingredients

Amt	Name	Type	#	%/IBU
315.00 g	PH 5.2 Stabilizer (Mash 60.0 mins)	Water Agent	1	-
122 lbs 10.0 oz	Rye Malt (9.7 SRM)	Grain	2	43.5 %
98 lbs 1.6 oz	Lager Malt (13.0 SRM)	Grain	3	34.8 %
49 lbs 0.8 oz	Munich Malt (20.0 SRM)	Grain	4	17.4 %
12 lbs 4.2 oz	Corn, Flaked (4.0 SRM)	Grain	5	4.3 %
19.98 oz	Hallertauer [4.80 %] - Boil 65.0 min	Hop	6	14.1 IBUs
25.0 pkg	Hefeweizen IV Ale (White Labs #WLP380) [35.49 ml]	Yeast	7	-

Corn roggenbier

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Gravity, Alcohol Content and Color

Est Original Gravity: 1.051 SG
Est Final Gravity: 1.010 SG
Estimated Alcohol by Vol: 5.4 %
Bitterness: 14.1 IBUs
Est Color: 14.0 SRM

Measured Original Gravity: 1.046 SG
Measured Final Gravity: 1.010 SG
Actual Alcohol by Vol: 4.7 %
Calories: 151.6 kcal/12oz

Mash Profile

Mash Name: Single Infusion, Light Body, No Mash Out
Sparge Water: 87.65 gal
Sparge Temperature: 168.0 F
Adjust Temp for Equipment: TRUE
Est Mash PH: 5.39
Measured Mash PH: 5.20

Total Grain Weight: 282 lbs 0.7 oz
Grain Temperature: 72.0 F
Tun Temperature: 72.0 F
Target Mash PH: 5.20
Mash Acid Addition:
Sparge Acid Addition:

Mash Steps

Name	Description	Step Temperature	Step Time
Mash In	Add 352.55 qt of water at 161.7 F	150.0 F	75 min

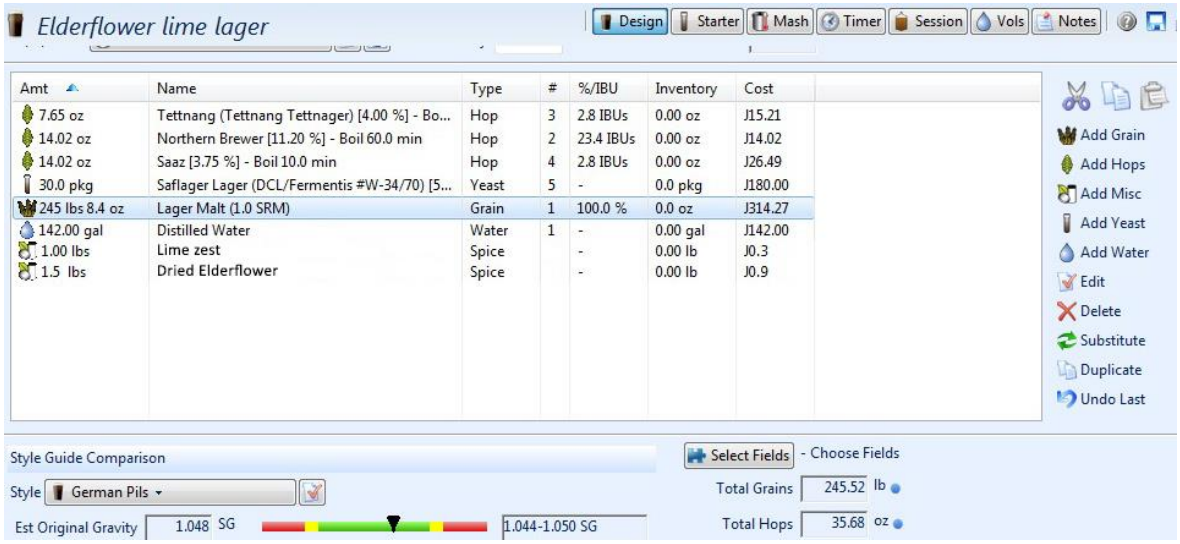
Sparge: Fly sparge with 87.65 gal water at 168.0 F

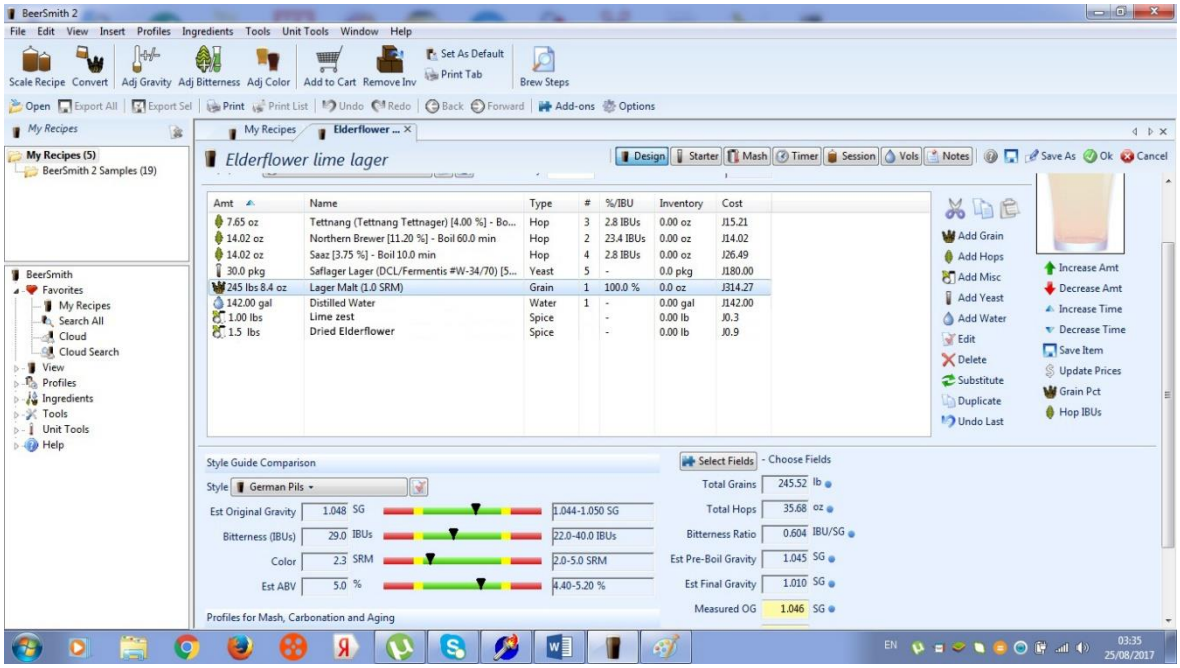
Mash Notes: Simple single infusion mash for use with most modern well modified grains (about 95% of the time).

Carbonation and Storage

Carbonation Type: Bottle
Pressure/Weight: 103.09 oz
Keg/Bottling Temperature: 70.0 F
Fermentation: Ale, Two Stage
Fermenter:

Volumes of CO2: 2.3
Carbonation Est: Bottle with 103.09 oz Corn Sugar
Carbonation (from Meas Vol): Bottle with 3.93 oz Corn Sugar
Age for: 30.00 days
Storage Temperature: 65.0 F


Elderflower lime lager
Design
Starter
Mash
Timer
Session
Vols
Notes
Amt
Name
Type
#
%/IBU
Inventory
Cost
7.65 oz
Tettnang (Tettnang Tettnager) [4.00 %] - Bo...
Hop
3
2.8 IBUs
0.00 oz
J15.21
14.02 oz
Northern Brewer [11.20 %] - Boil 60.0 min
Hop
2
23.4 IBUs
0.00 oz
J14.02
14.02 oz
Saaz [3.75 %] - Boil 10.0 min
Hop
4
2.8 IBUs
0.00 oz
J26.49
30.0 pkg
Saflager Lager (DCL/Fermentis #W-34/70) [5...
Yeast
5
-
0.0 pkg
J180.00
245 lbs 8.4 oz
Lager Malt (1.0 SRM)
Grain
1
100.0 %
0.0 oz
J314.27
142.00 gal
Distilled Water
Water
1
-
0.00 gal
J142.00
1.00 lbs
Lime zest
Spice
-
0.00 lb
J0.3
1.5 lbs
Dried Elderflower
Spice
-
0.00 lb
J0.9
Add Grain
Add Hops
Add Misc
Add Yeast
Add Water
Edit
Delete
Substitute
Duplicate
Undo Last
Style Guide Comparison
Style
German Pils
Est Original Gravity
1.048
SG
1.044-1.050 SG
Select Fields
- Choose Fields
Total Grains
245.52
lb
Total Hops
35.68
oz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Adj Bitterness
Adj Color
Add to Cart
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Set As Default
Print Tab
Brew Steps
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Print
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Undo
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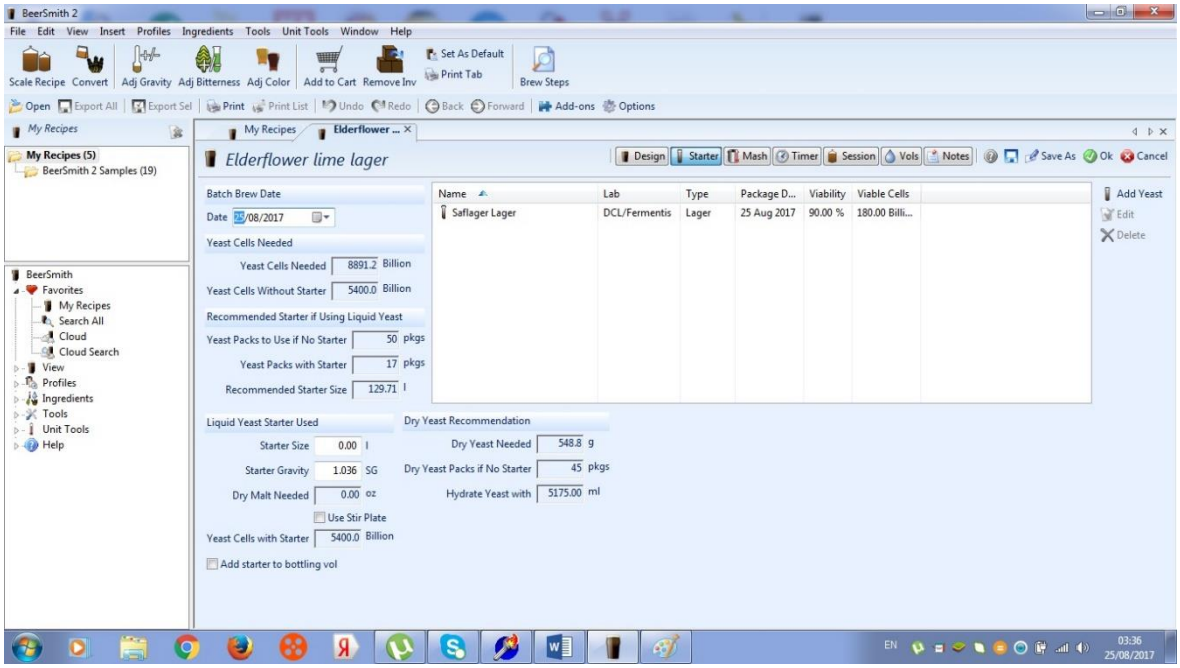
Forward
Add-ons
Options
My Recipes
Elderflower ...
Elderflower lime lager
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Cancel
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
Amt
Name
Type
#
%/IBU
Inventory
Cost
7.65 oz
Tettnang (Tettnang Tettnager) [4.00 %] - Bo...
Hop
3
2.8 IBUs
0.00 oz
J15.21
14.02 oz
Northern Brewer [11.20 %] - Boil 60.0 min
Hop
2
23.4 IBUs
0.00 oz
J14.02
14.02 oz
Saaz [3.75 %] - Boil 10.0 min
Hop
4
2.8 IBUs
0.00 oz
J26.49
30.0 pkg
Saflager Lager (DCL/Fermentis #W-34/70) [5...
Yeast
5
-
0.0 pkg
J180.00
245 lbs 8.4 oz
Lager Malt (1.0 SRM)
Grain
1
100.0 %
0.0 oz
J314.27
142.00 gal
Distilled Water
Water
1
-
0.00 gal
J142.00
1.00 lbs
Lime zest
Spice
-
0.00 lb
J0.3
1.5 lbs
Dried Elderflower
Spice
-
0.00 lb
J0.9
Add Grain
Add Hops
Add Misc
Add Yeast
Add Water
Edit
Delete
Substitute
Duplicate
Undo Last
Increase Amt
Decrease Amt
Increase Time
Decrease Time
Save Item
Update Prices
Grain Pct
Hop IBUs
Style Guide Comparison
Style
German Pils
Est Original Gravity
1.048
SG
1.044-1.050 SG
Bitterness (IBUs)
29.0
IBUs
22.0-40.0 IBUs
Color
2.3
SRM
2.0-5.0 SRM
Est ABV
5.0
%
4.40-5.20 %
Profiles for Mash, Carbonation and Aging
Select Fields
- Choose Fields
Total Grains
245.52
lb
Total Hops
35.68
oz
Bitterness Ratio
0.604
IBU/SG
Est Pre-Boil Gravity
1.045
SG
Est Final Gravity
1.010
SG
Measured OG
1.046
SG
EN
03:35
25/08/2017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Adj Gravity
Adj Bitterness
Adj Color
Add to Cart
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Set As Default
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Brew Steps
Open
Export All
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Print
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Undo
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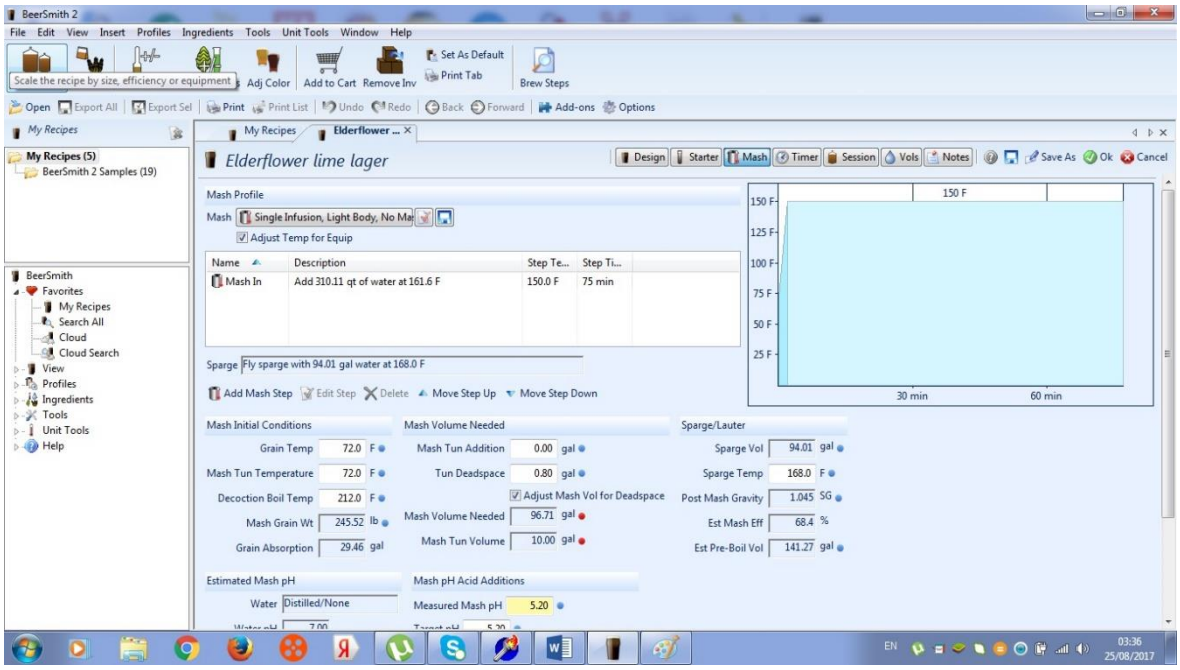
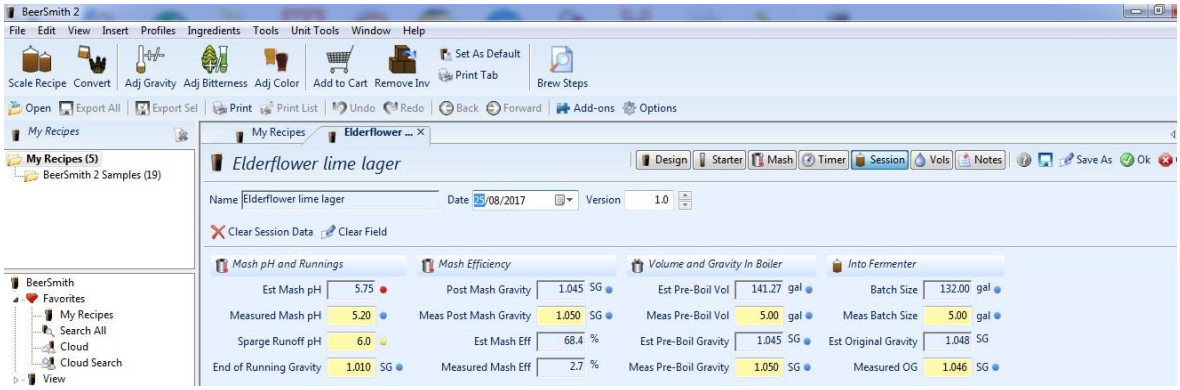
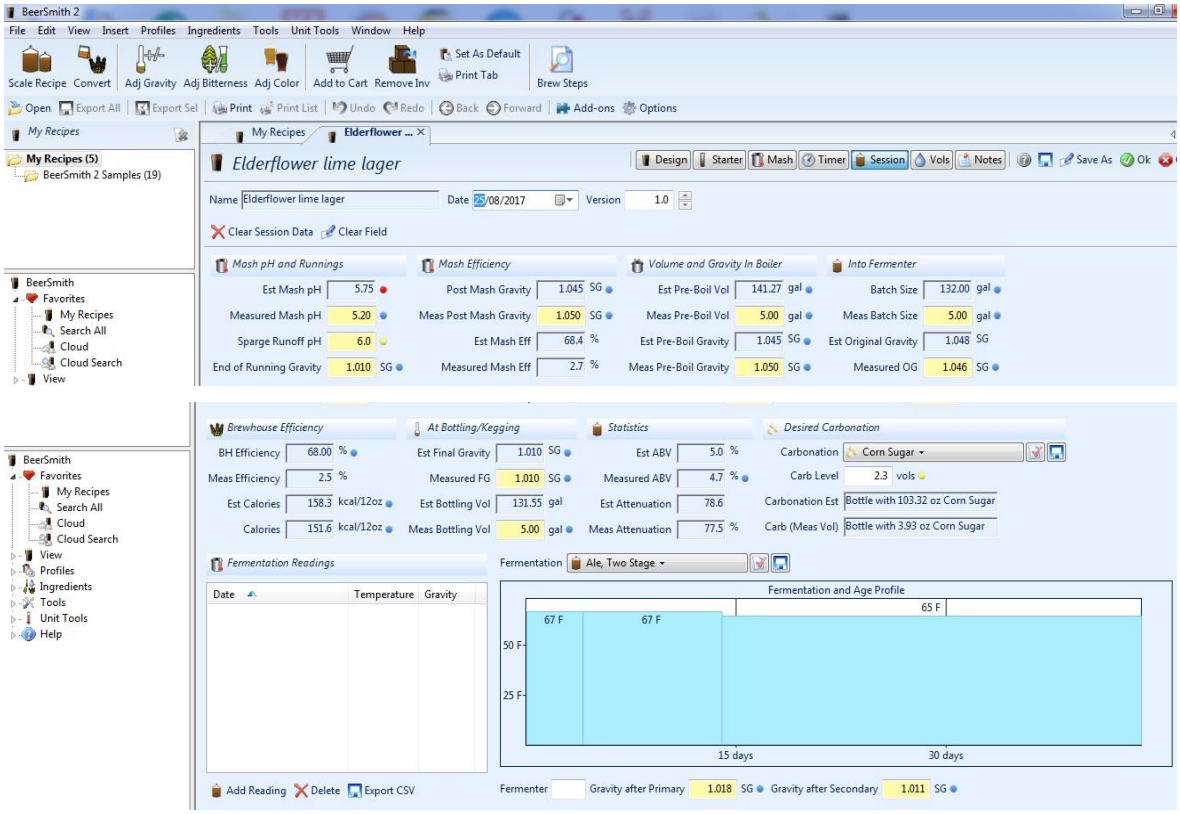
Forward
Add-ons
Options
My Recipes
Elderflower ...
Elderflower lime lager
Design
Starter
Mash
Timer
Session
Vols
Notes
Save As
Ok
Cancel
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
Batch Brew Date
Date
08/2017
Yeast Cells Needed
Yeast Cells Needed
8891.2
Billion
Yeast Cells Without Starter
5400.0
Billion
Recommended Starter if Using Liquid Yeast
Yeast Packs to Use if No Starter
50
pkgs
Yeast Packs with Starter
17
pkgs
Recommended Starter Size
129.71
l
Liquid Yeast Starter Used
Starter Size
0.00
l
Starter Gravity
1.036
SG
Dry Malt Needed
0.00
oz
Use Stir Plate
Yeast Cells with Starter
5400.0
Billion
Add starter to bottling vol
Dry Yeast Recommendation
Dry Yeast Needed
548.8
g
Dry Yeast Packs if No Starter
45
pkgs
Hydrate Yeast with
5175.00
ml
Name
Lab
Type
Package D...
Viability
Viable Cells
Saflager Lager
DCL/Fermentis
Lager
25 Aug 2017
90.00 %
180.00 Billi...
Add Yeast
Edit
Delete
EN
03:36
25/08/2017


BeerSmith 2
Elderflower lime lager
Mash Profile
Single Infusion, Light Body, No Ma
Mash In
Add 310.11 qt of water at 161.6 F
Sparge
Fly sparge with 94.01 gal water at 168.0 F
Mash Initial Conditions
Mash Volume Needed
Sparge/Lauter
Estimated Mash pH
Mash pH Acid Additions
Measured Mash pH 5.20


BeerSmith 2
Elderflower lime lager
Name Elderflower lime lager
Date 25/08/2017
Version 1.0
Mash pH and Runnings
Mash Efficiency
Volume and Gravity In Boiler
Into Fermenter
Est Mash pH 5.75
Measured Mash pH 5.20
Sparge Runoff pH 6.0
End of Running Gravity 1.010 SG
Post Mash Gravity 1.045 SG
Meas Post Mash Gravity 1.050 SG
Est Mash Eff 68.4 %
Measured Mash Eff 2.7 %
Est Pre-Boil Vol 141.27 gal
Meas Pre-Boil Vol 5.00 gal
Est Pre-Boil Gravity 1.045 SG
Meas Pre-Boil Gravity 1.050 SG
Batch Size 132.00 gal
Meas Batch Size 5.00 gal
Est Original Gravity 1.048 SG
Measured OG 1.046 SG


BeerSmith 2
Elderflower lime lager
Brewhouse Efficiency
At Bottling/Kegging
Statistics
Desired Carbonation
BH Efficiency 68.00 %
Meas Efficiency 2.5 %
Est Calories 158.3 kcal/12oz
Calories 151.6 kcal/12oz
Est Final Gravity 1.010 SG
Measured FG 1.010 SG
Est Bottling Vol 131.55 gal
Meas Bottling Vol 5.00 gal
Est ABV 5.0 %
Measured ABV 4.7 %
Est Attenuation 78.6
Meas Attenuation 77.5 %
Carbonation Corn Sugar
Carb Level 2.3 vols
Carbonation Est Bottle with 103.32 oz Corn Sugar
Carb (Meas Vol) Bottle with 3.93 oz Corn Sugar
Fermentation Readings
Date
Temperature
Gravity
Fermentation Ale, Two Stage
Fermentation and Age Profile
67 F
67 F
65 F
50 F
25 F
15 days
30 days
Add Reading
Delete
Export CSV
Fermenter
Gravity after Primary 1.018 SG
Gravity after Secondary 1.011 SG

Elderflower lime lager

German Pils (5 D)

Type: All Grain
Batch Size: 132.00 gal
Boil Size: 141.27 gal
Boil Time: 100 min
End of Boil Vol: 138.28 gal
Final Bottling Vol: 131.55 gal
Fermentation: Ale, Two Stage

Date: 25 Aug 2017
Brewer:
Asst Brewer:
Equipment: Pot (18.5 Gal/70 L) and Cooler (9.5 Gal/40 L) - All Grain
Efficiency: 68.00 %
Est Mash Efficiency: 68.4 %
Taste Rating: 30.0

Taste Notes:

Ingredients

Amt	Name	Type	#	%/IBU
245 lbs 8.4 oz	Lager Malt (1.0 SRM)	Grain	1	100.0 %
14.02 oz	Northern Brewer [11.20 %] - Boil 60.0 min	Hop	2	23.4 IBUs
7.65 oz	Tettnang (Tettnang Tettnager) [4.00 %] - Boil 20.0 min	Hop	3	2.8 IBUs
14.02 oz	Saaz [3.75 %] - Boil 10.0 min	Hop	4	2.8 IBUs
30.0 pkg	Saflager Lager (DCL/Fermentis #W-34/70) [50.28 ml]	Yeast	5	-

Elderflower lime lager

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Gravity, Alcohol Content and Color

Est Original Gravity: 1.048 SG
Est Final Gravity: 1.010 SG
Estimated Alcohol by Vol: 5.0 %
Bitterness: 29.0 IBUs
Est Color: 2.3 SRM

Measured Original Gravity: 1.046 SG
Measured Final Gravity: 1.010 SG
Actual Alcohol by Vol: 4.7 %
Calories: 151.6 kcal/12oz

Mash Profile

Mash Name: Single Infusion, Light Body, No Mash Out
Sparge Water: 94.01 gal
Sparge Temperature: 168.0 F
Adjust Temp for Equipment: TRUE
Est Mash PH: 5.75
Measured Mash PH: 5.20

Total Grain Weight: 245 lbs 8.4 oz
Grain Temperature: 72.0 F
Tun Temperature: 72.0 F
Target Mash PH: 5.20
Mash Acid Addition:
Sparge Acid Addition:

Mash Steps

Name	Description	Step Temperature	Step Time
Mash In	Add 310.11 qt of water at 161.6 F	150.0 F	75 min

Sparge: Fly sparge with 94.01 gal water at 168.0 F
Mash Notes: Simple single infusion mash for use with most modern well modified grains (about 95% of the time).

Carbonation and Storage

Carbonation Type: Bottle
Pressure/Weight: 103.32 oz
Keg/Bottling Temperature: 70.0 F
Fermentation: Ale, Two Stage
Fermenter:

Volumes of CO2: 2.3
Carbonation Est: Bottle with 103.32 oz Corn Sugar
Carbonation (from Meas Vol): Bottle with 3.93 oz Corn Sugar
Age for: 30.00 days
Storage Temperature: 65.0 F

Rhubarb rose saison

Design | Starter | Mash | Timer | Session | Vols | Notes

Amt	Name	Type	#	%/IBU	Inventory	Cost
4.05 oz	Saaz [3.75 %] - Boil 5.0 min	Hop	9	0.4 IBUs	0.00 oz	J7.66
4.05 oz	Styrian Golding (Savinja Golding) [5.25 %] - ...	Hop	1.	0.6 IBUs	0.00 oz	J6.45
9.46 oz	Saaz [3.75 %] - Boil 20.0 min	Hop	7	3.1 IBUs	0.00 oz	J17.88
9.46 oz	Styrian Golding (Savinja Golding) [5.25 %] - ...	Hop	8	4.4 IBUs	0.00 oz	J15.04
18.92 oz	Styrian Golding (Savinja Golding) [5.25 %] - ...	Hop	6	14.4 IBUs	0.00 oz	J30.08
34.0 pkg	Wyeast Ale Blend (Wyeast Labs #1087) [124....	Yeast	1.	-	0.0 pkg	J204.00
8 lbs 1.0 oz	Melanoiden Malt (20.0 SRM)	Grain	5	3.1 %	0.0 oz	J10.32
12 lbs 10.7 oz	White Wheat Malt (2.4 SRM)	Grain	4	4.9 %	0.0 oz	J16.21
21 lbs 14.1 oz	Munich Malt (9.0 SRM)	Grain	3	8.5 %	0.0 oz	J28.01
215 lbs 5.5 oz	Pilsner (2 Row) Bel (2.0 SRM)	Grain	2	83.5 %	0.0 oz	J275.64
143.14 gal	Distilled Water	Water	1	-	0.00 gal	J143.14
4.4 lbs	Rhubarb Puree	Spice		-	0.00 lb	J0.3
0.13 gal	Rose Water	Water	1	-	0.00 gal	J143.14

Add Grain | Add Hops | Add Misc | Add Yeast | Add Water | Edit | Delete | Substitute | Duplicate | Undo Last

Style Guide Comparison

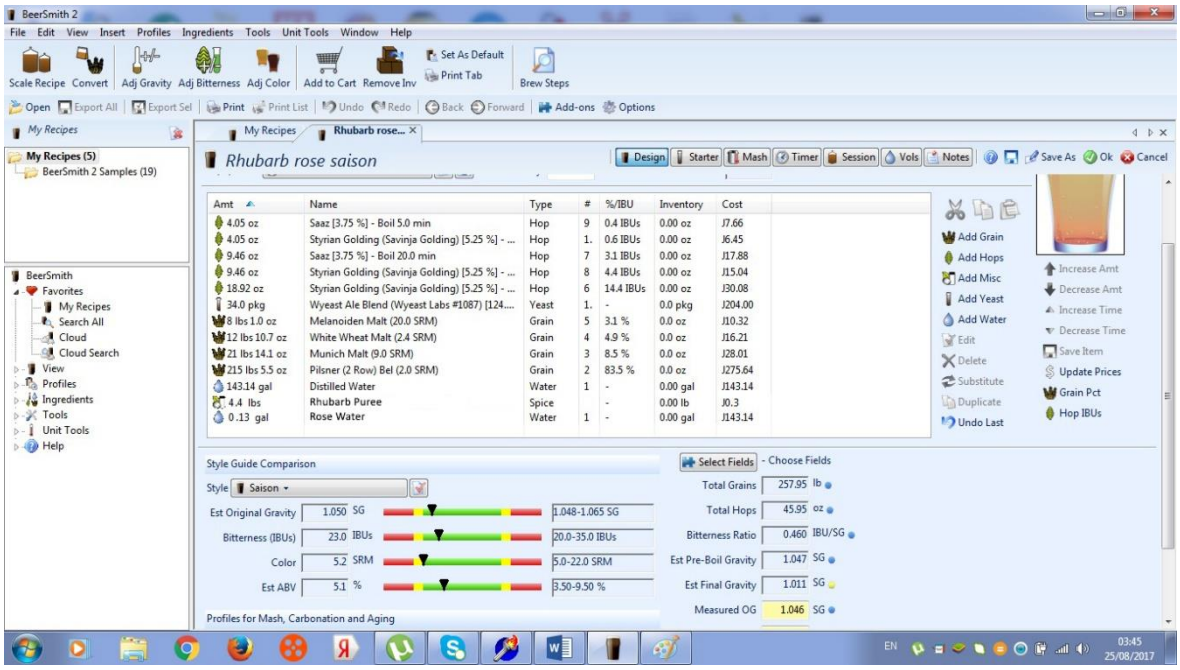
Style: Saison

Est Original Gravity: 1.050 SG (1.048-1.065 SG)

Select Fields - Choose Fields

Total Grains: 257.95 lb

Total Hops: 45.95 oz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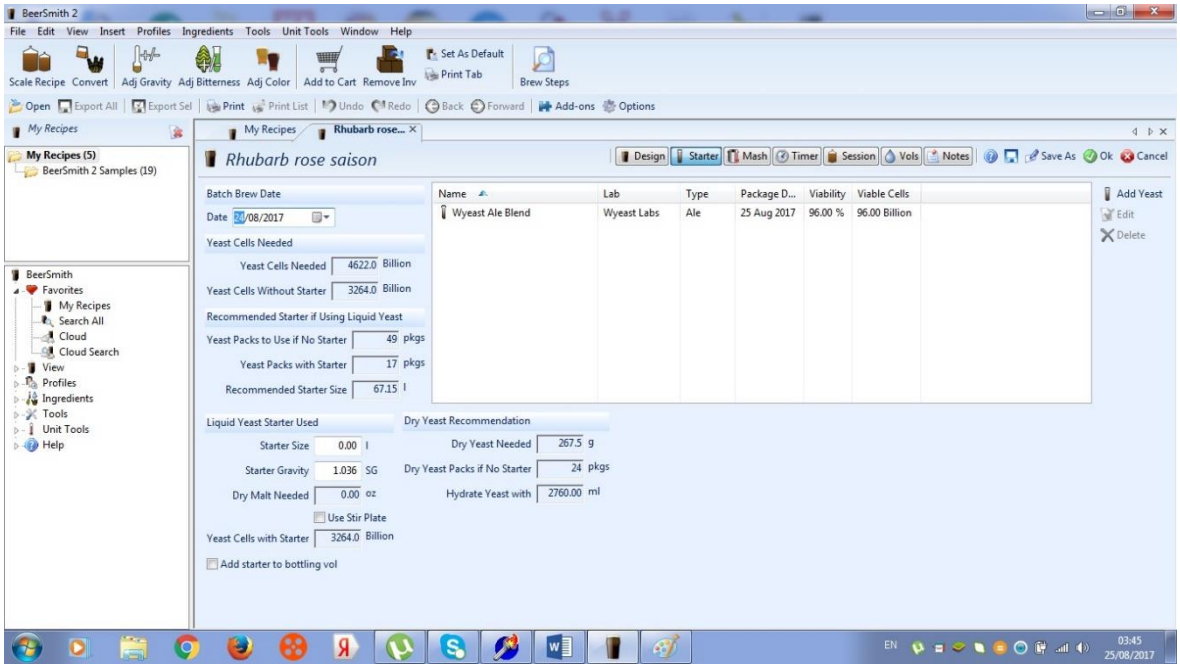
File Edit View Insert Profiles Ingredients Tools Unit Tools Window Help
Scale Recipe Convert Adj Gravity Adj Bitterness Adj Color Add to Cart Remove Inv Set As Default Print Tab Brew Steps
Open Export All Export Sel Print Print List Undo Redo Back Forward Add-ons Options
My Recipes
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
Rhubarb rose saison
Design Starter Mash Timer Session Vols Notes Save As Ok Cancel
Amt Name Type # %/IBU Inventory Cost
4.05 oz Saaz [3.75 %] - Boil 5.0 min Hop 9 0.4 IBUs 0.00 oz J7.66
4.05 oz Styrian Golding (Savinja Golding) [5.25 %] - ... Hop 1. 0.6 IBUs 0.00 oz J6.45
9.46 oz Saaz [3.75 %] - Boil 20.0 min Hop 7 3.1 IBUs 0.00 oz J17.88
9.46 oz Styrian Golding (Savinja Golding) [5.25 %] - ... Hop 8 4.4 IBUs 0.00 oz J15.04
18.92 oz Styrian Golding (Savinja Golding) [5.25 %] - ... Hop 6 14.4 IBUs 0.00 oz J30.08
34.0 pkg Wyeast Ale Blend (Wyeast Labs #1087) [124.... Yeast 1. - 0.0 pkg J204.00
8 lbs 1.0 oz Melanoiden Malt (20.0 SRM) Grain 5 3.1 % 0.0 oz J10.32
12 lbs 10.7 oz White Wheat Malt (2.4 SRM) Grain 4 4.9 % 0.0 oz J16.21
21 lbs 14.1 oz Munich Malt (9.0 SRM) Grain 3 8.5 % 0.0 oz J28.01
215 lbs 5.5 oz Pilsner (2 Row) Bel (2.0 SRM) Grain 2 83.5 % 0.0 oz J275.64
143.14 gal Distilled Water Water 1 - 0.00 gal J143.14
4.4 lbs Rhubarb Puree Spice - 0.00 lb J0.3
0.13 gal Rose Water Water 1 - 0.00 gal J143.14
Add Grain Add Hops Add Misc Add Yeast Add Water Edit Delete Substitute Duplicate Undo Last
Increase Amt Decrease Amt Increase Time Decrease Time Save Item Update Prices Grain Pct Hop IBUs
Style Guide Comparison
Style Saison
Est Original Gravity 1.050 SG 1.048-1.065 SG
Bitterness (IBUs) 23.0 IBUs 20.0-35.0 IBUs
Color 5.2 SRM 5.0-22.0 SRM
Est ABV 5.1 % 3.50-9.50 %
Profiles for Mash, Carbonation and Aging
Select Fields - Choose Fields
Total Grains 257.95 lb
Total Hops 45.95 oz
Bitterness Ratio 0.460 IBU/SG
Est Pre-Boil Gravity 1.047 SG
Est Final Gravity 1.011 SG
Measured OG 1.046 SG
EN 03:45 25/08/2017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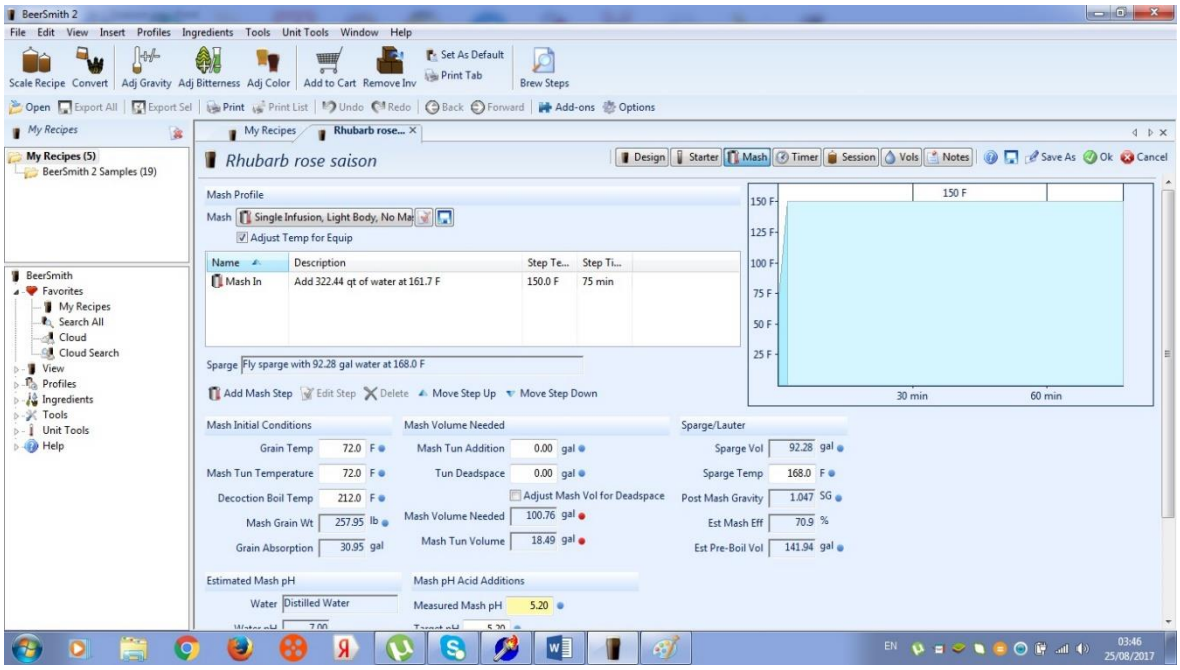
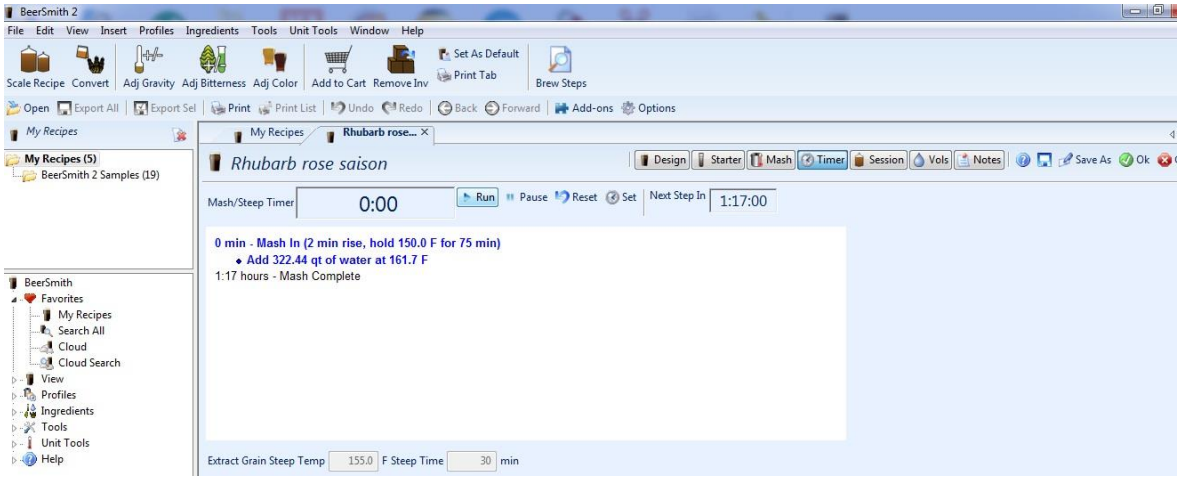
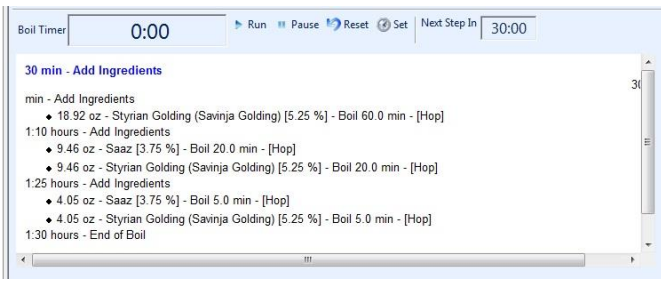
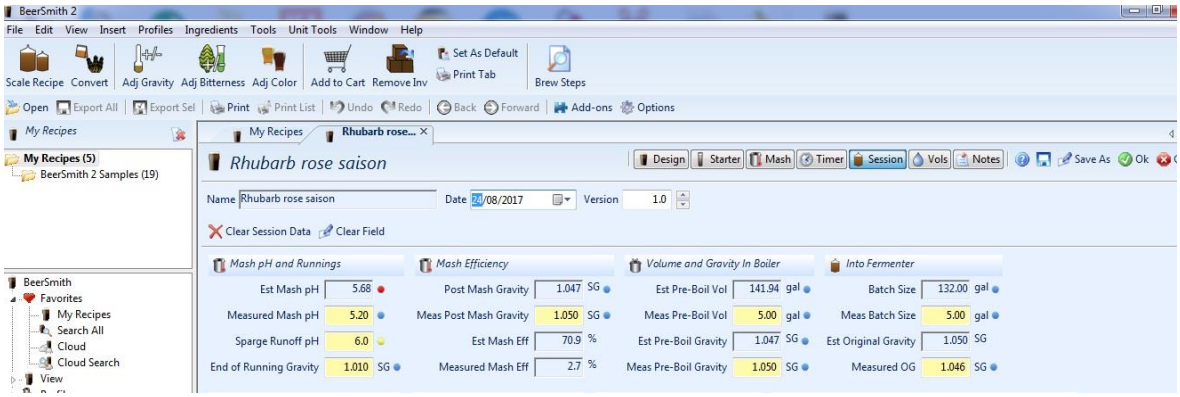
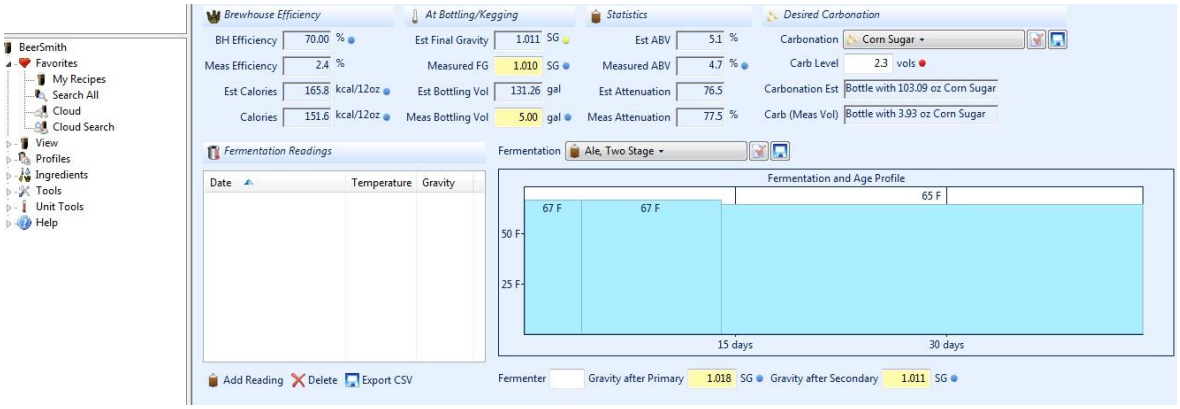
Scale Recipe Convert Adj Gravity Adj Bitterness Adj Color Add to Cart Remove Inv Set As Default Print Tab Brew Steps
Open Export All Export Sel Print Print List Undo Redo Back Forward Add-ons Options
My Recipes
My Recipes (5)
BeerSmith 2 Samples (19)
BeerSmith
Favorites
My Recipes
Search All
Cloud
Cloud Search
View
Profiles
Ingredients
Tools
Unit Tools
Help
Rhubarb rose saison
Design Starter Mash Timer Session Vols Notes Save As Ok Cancel
Batch Brew Date
Date 24/08/2017
Yeast Cells Needed
Yeast Cells Needed 4622.0 Billion
Yeast Cells Without Starter 3264.0 Billion
Recommended Starter if Using Liquid Yeast
Yeast Packs to Use if No Starter 49 pkgs
Yeast Packs with Starter 17 pkgs
Recommended Starter Size 67.15 l
Name Lab Type Package D... Viability Viable Cells
Wyeast Ale Blend Wyeast Labs Ale 25 Aug 2017 96.00 % 96.00 Billion
Add Yeast Edit Delete
Liquid Yeast Starter Used
Starter Size 0.00 l
Starter Gravity 1.036 SG
Dry Malt Needed 0.00 oz
Use Stir Plate
Yeast Cells with Starter 3264.0 Billion
Add starter to bottling vol
Dry Yeast Recommendation
Dry Yeast Needed 267.5 g
Dry Yeast Packs if No Starter 24 pkgs
Hydrate Yeast with 2760.00 ml
EN 03:45 25/08/2017


BeerSmith 2
Rhubarb rose saison
Mash Profile
Mash In
Add 322.44 qt of water at 161.7 F
Sparge
Fly sparge with 92.28 gal water at 168.0 F
Mash Initial Conditions
Mash Volume Needed
Sparge/Lauter
Estimated Mash pH
Mash pH Acid Additions


Rhubarb rose saison
Mash/Steep Timer
0:00
Next Step In
1:17:00
0 min - Mash In (2 min rise, hold 150.0 F for 75 min)
Add 322.44 qt of water at 161.7 F
1:17 hours - Mash Complete
Extract Grain Steep Temp
Steep Time


Boil Timer
0:00
Next Step In
30:00
30 min - Add Ingredients
min - Add Ingredients
18.92 oz - Styrian Golding (Savinja Golding) [5.25 %] - Boil 60.0 min - [Hop]
1:10 hours - Add Ingredients
9.46 oz - Saaz [3.75 %] - Boil 20.0 min - [Hop]
9.46 oz - Styrian Golding (Savinja Golding) [5.25 %] - Boil 20.0 min - [Hop]
1:25 hours - Add Ingredients
4.05 oz - Saaz [3.75 %] - Boil 5.0 min - [Hop]
4.05 oz - Styrian Golding (Savinja Golding) [5.25 %] - Boil 5.0 min - [Hop]
1:30 hours - End of Boil


Rhubarb rose saison
Name
Rhubarb rose saison
Date
Version
Mash pH and Runnings
Mash Efficiency
Volume and Gravity In Boiler
Into Fermenter



Rhubarb rose saison

Saison (25 B)

Type: All Grain
Batch Size: 132.00 gal
Boil Size: 141.94 gal
Boil Time: 90 min
End of Boil Vol: 139.24 gal
Final Bottling Vol: 131.26 gal
Fermentation: Ale, Two Stage

Date: 24 Aug 2017
Brewer:
Asst Brewer:
Equipment: Pot (18.5 Gal/70 L) - BIAB
Efficiency: 70.00 %
Est Mash Efficiency: 70.9 %
Taste Rating: 30.0

Taste Notes:

Ingredients

Amt	Name	Type	#	%/IBU
143.14 gal	Distilled Water	Water	1	-
215 lbs 5.5 oz	Pilsner (2 Row) Bel (2.0 SRM)	Grain	2	83.5 %
21 lbs 14.1 oz	Munich Malt (9.0 SRM)	Grain	3	8.5 %
12 lbs 10.7 oz	White Wheat Malt (2.4 SRM)	Grain	4	4.9 %
8 lbs 1.0 oz	Melanoiden Malt (20.0 SRM)	Grain	5	3.1 %
18.92 oz	Styrian Golding (Savinja Golding) [5.25 %] - Boil 60.0 min	Hop	6	14.4 IBUs
9.46 oz	Saaz [3.75 %] - Boil 20.0 min	Hop	7	3.1 IBUs
9.46 oz	Styrian Golding (Savinja Golding) [5.25 %] - Boil 20.0 min	Hop	8	4.4 IBUs
4.05 oz	Saaz [3.75 %] - Boil 5.0 min	Hop	9	0.4 IBUs
4.05 oz	Styrian Golding (Savinja Golding) [5.25 %] - Boil 5.0 min	Hop	10	0.6 IBUs
34.0 pkg	Wyeast Ale Blend (Wyeast Labs #1087) [124.21 ml]	Yeast	11	-

Rhubarb rose saison

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Gravity, Alcohol Content and Color

Est Original Gravity: 1.050 SG
Est Final Gravity: 1.011 SG
Estimated Alcohol by Vol: 5.1 %
Bitterness: 23.0 IBUs
Est Color: 5.2 SRM

Measured Original Gravity: 1.046 SG
Measured Final Gravity: 1.010 SG
Actual Alcohol by Vol: 4.7 %
Calories: 151.6 kcal/12oz

Mash Profile

Mash Name: Single Infusion, Light Body, No Mash Out
Sparge Water: 92.28 gal
Sparge Temperature: 168.0 F
Adjust Temp for Equipment: TRUE
Est Mash PH: 5.68
Measured Mash PH: 5.20

Total Grain Weight: 258 lbs
Grain Temperature: 72.0 F
Tun Temperature: 72.0 F
Target Mash PH: 5.20
Mash Acid Addition:
Sparge Acid Addition:

Mash Steps

Name	Description	Step Temperature	Step Time
Mash In	Add 322.44 qt of water at 161.7 F	150.0 F	75 min

Sparge: Fly sparge with 92.28 gal water at 168.0 F

Mash Notes: Simple single infusion mash for use with most modern well modified grains (about 95% of the time).

Carbonation and Storage

Carbonation Type: Bottle
Pressure/Weight: 103.09 oz
Keg/Bottling Temperature: 70.0 F
Fermentation: Ale, Two Stage
Fermenter:

Volumes of CO2: 2.3
Carbonation Est: Bottle with 103.09 oz Corn Sugar
Carbonation (from Meas Vol): Bottle with 3.93 oz Corn Sugar
Age for: 30.00 days
Storage Temperature: 65.0 F

Appendix 4. Bottle labels and cork

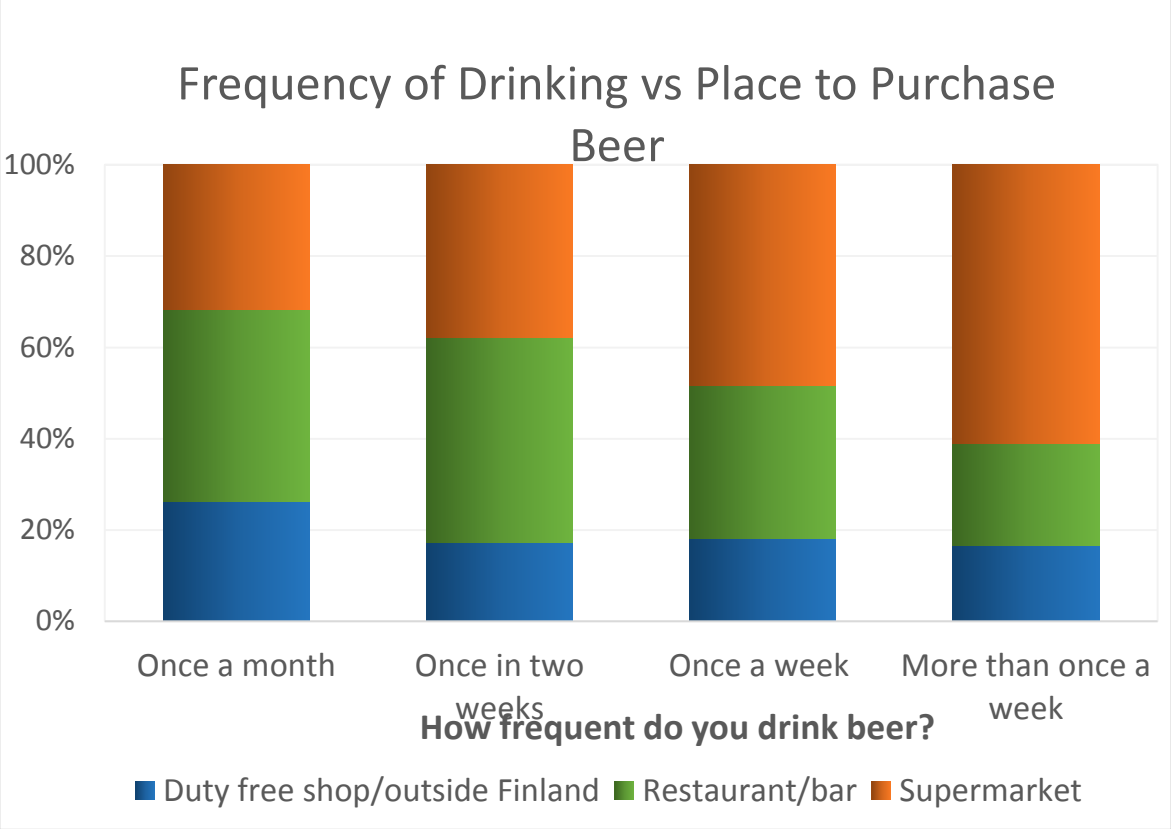
Appendix 5. Market analysis

1) Where do those respondents who drink one a week or in two weeks or more often beer?

How frequent to you drink beer?	Where do you mostly purchase beer?			
	Duty free shop/outside Finland	Restau-rant/bar	Supermarket	Grand Total
More than once a week	3	4	11	18
Once a month	5	8	6	19
Once a week	6	11	16	33
Once in two weeks	5	13	11	29

How frequent to you drink beer?	Where do you mostly purchase beer?			
	Duty free shop/outside Finland	Restau-rant/bar	Supermarket	Grand Total
Once a month	26%	42%	32%	100%
Once in two weeks	17%	45%	38%	100%
Once a week	18%	33%	48%	100%

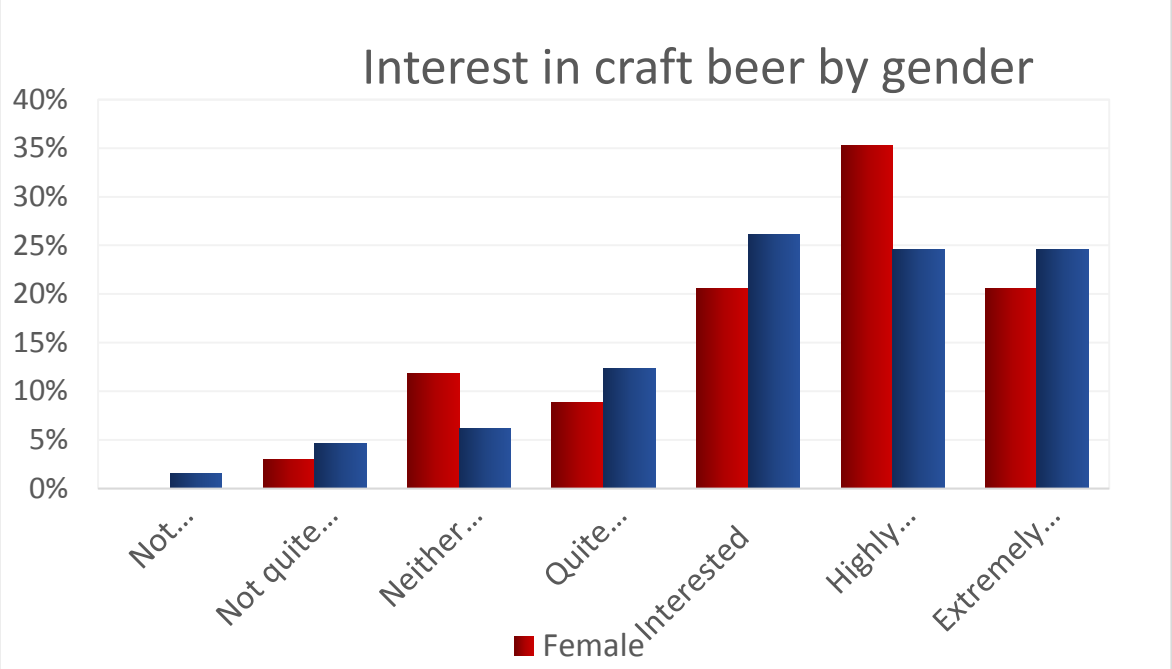
More than once a week	17%	22%	61%	100%



2) Which gender is more interested in craft beer?

How interested are you in craft beer?								
Gender	1	2	3	4	5	6	7	Total
Female		1	4	3	7	12	7	34
Male	1	3	4	8	17	16	16	65

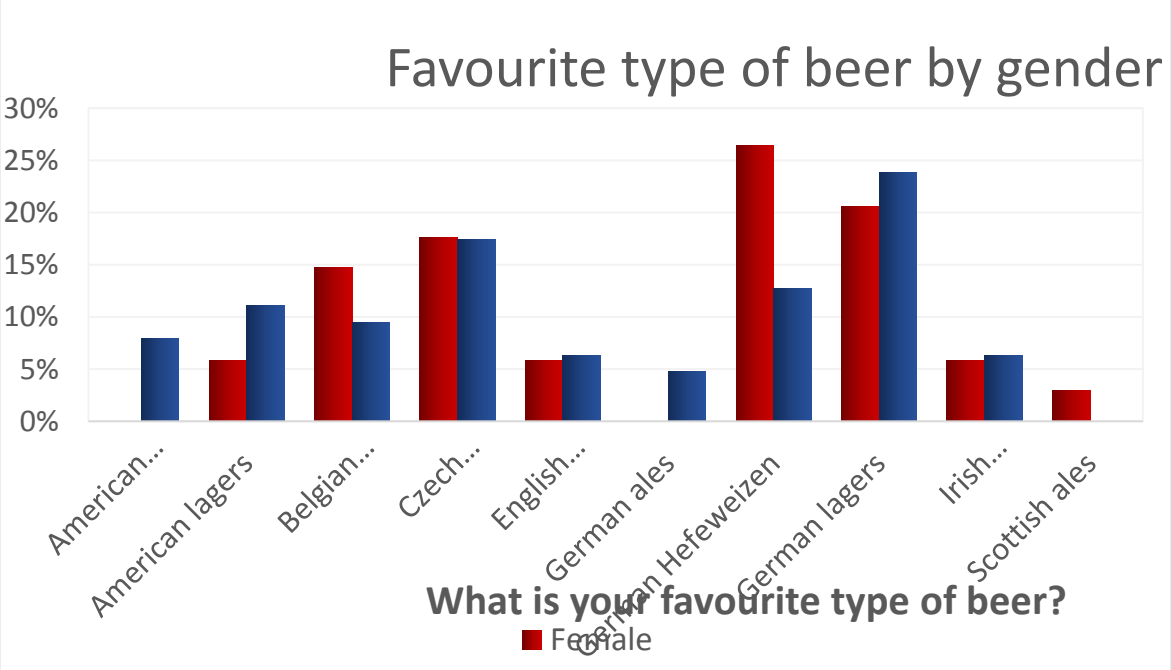
Gender	How interested are you in craft beer?							Total	Total Score
	Not interested	Not quite interested	Neither interested nor disinterested	Quite interested	Interested	Highly interested	Extremely interested		
Female	0.0%	2.9%	11.8%	8.8%	20.6%	**35.3%**	20.6%	100%	**5.352941**
Male	1.5%	4.6%	6.2%	12.3%	26.2%	24.6%	24.6%	100%	**5.292308**



3) Which gender prefers which type of beer?

What is your favourite type of beer?											
Gender	American ales	American lagers	Belgian ales	Check lagers	English ales	German ales	German Hefeweizen	German lagers	Irish ales	Scottish ales	Total
Female		2	5	6	2		9	7	2	1	34
Male	5	7	6	11	4	3	8	15	4		63
Grand Total	5	9	11	17	6	3	17	22	6	1	97

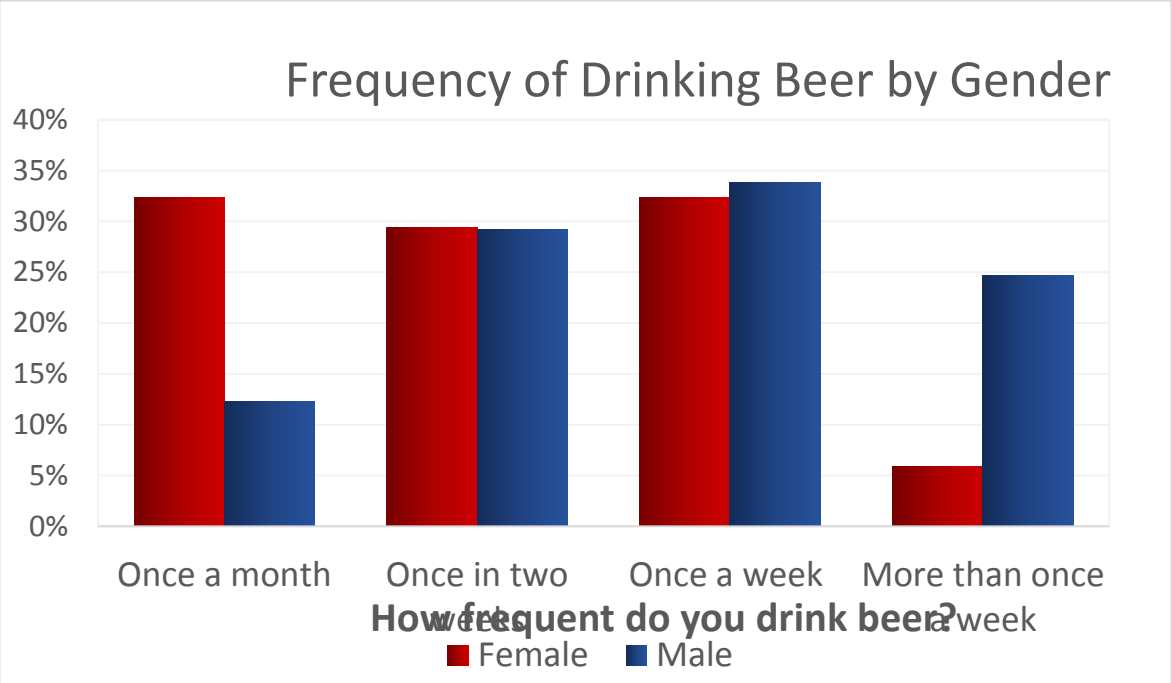
	What is your favourite type of beer?										
Gender	American ales	American lagers	Belgian ales	Czech lagers	English ales	German ales	German Hefeweizen	German lagers	Irish ales	Scottish ales	Total
Female	0%	6%	15%	18%	6%	0%	**26%**	21%	6%	3%	100%
Male	8%	11%	10%	17%	6%	5%	13%	**24%**	6%	0%	100%



Frequency of drinking beer by gender

Gender	How frequent do you drink beer?				Total
	Once a month	Once in two weeks	Once a week	More than once a week	
Female	11	10	11	2	34
Male	8	19	22	16	65
Grand Total	19	29	33	18	99

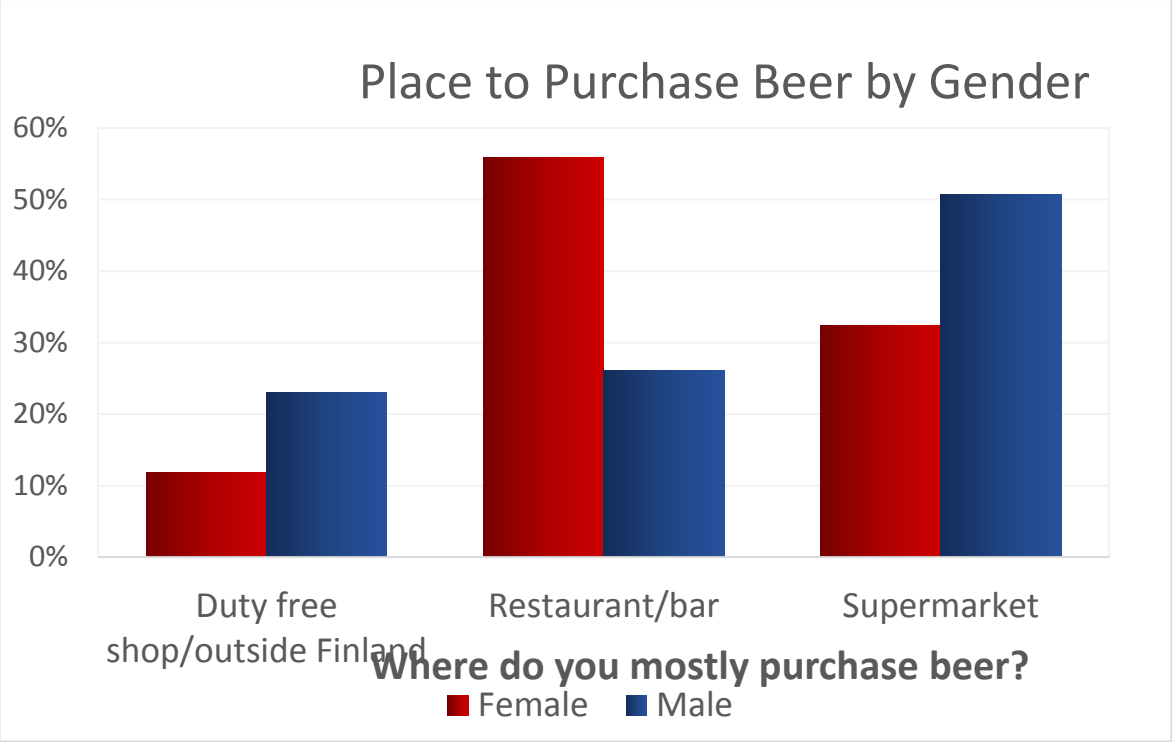
Gender	How frequent do you drink beer?				Total
	Once a month	Once in two weeks	Once a week	More than once a week	
Female	32%	29%	32%	6%	100%
Male	12%	29%	34%	25%	100%



Place to purchase beer by gender

Gender	Where do you mostly purchase beer?			Total
	Duty free shop/outside Finland	Restaurant/bar	Supermarket	
Female	4	19	11	34
Male	15	17	33	65
Grand Total	19	36	44	99

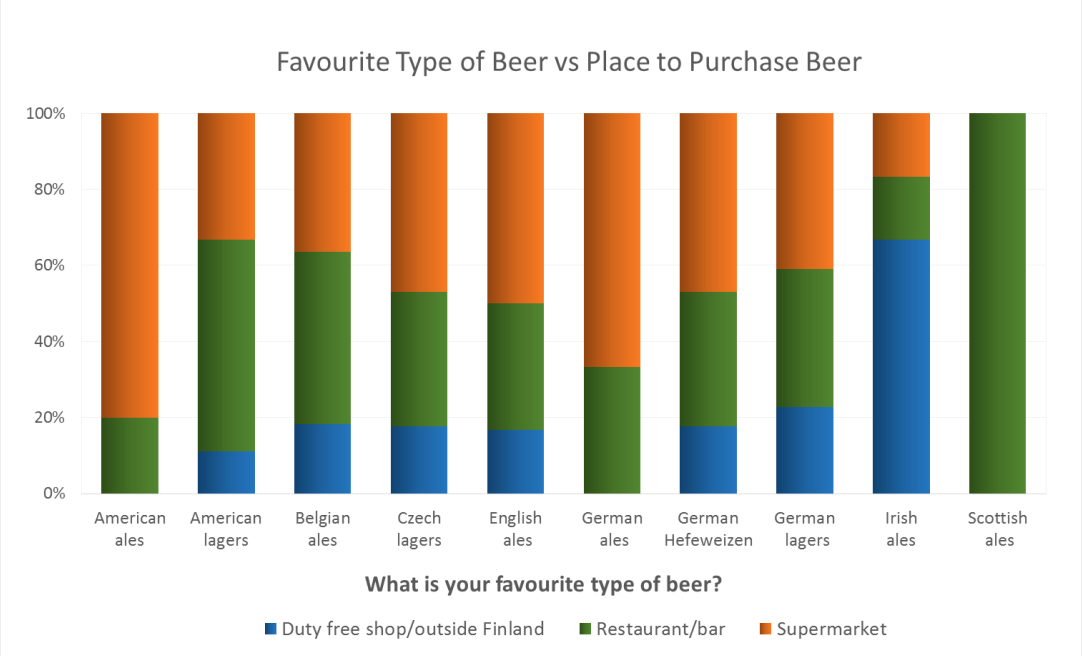
Gender	Where do you mostly purchase beer?			Total
	Duty free shop/outside Finland	Restaurant/bar	Supermarket	
Female	12%	56%	32%	100%
Male	23%	26%	51%	100%



Favourite type of beer vs place to purchase beer

Where do you mostly purchase your beer	What is your favourite type of beer?										Grand Total
	American ales	American lagers	Belgian ales	Czech lagers	English ales	German ales	German HeFeWeizen	German lagers	Irish ales	Scottish ales	
Duty free shop/ou	0	1	2	3	1	0	3	5	4	0	19
Restaurant/bar	1	5	5	6	2	1	6	8	1	1	36
Supermarket	4	3	4	8	3	2	8	9	1	0	42
Grand Total	5	9	11	17	6	3	17	22	6	1	97

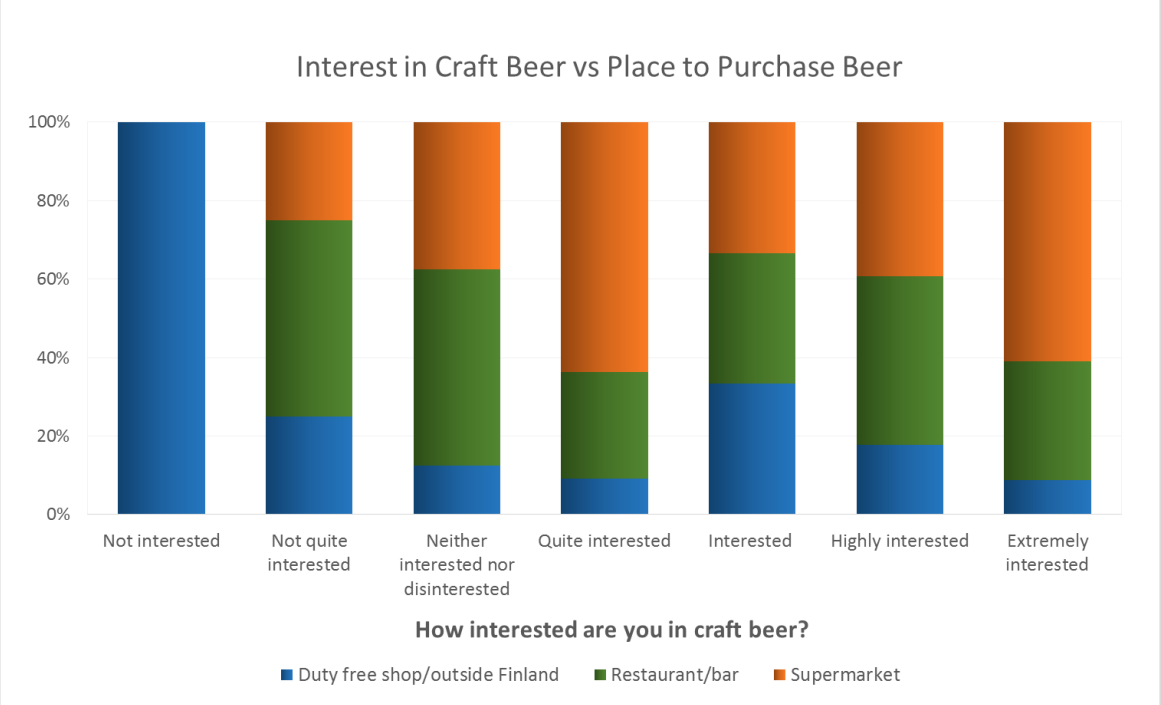
Where do you mostly purchase your beer	What is your favourite type of beer?									
	American ales	American lagers	Belgian ales	Czech lagers	English ales	German ales	German Hefeweizen	German lagers	Irish ales	Scottish ales
Duty free shop/ou	0%	11%	18%	18%	17%	0%	18%	23%	67%	0%
Restaurant/bar	20%	56%	45%	35%	33%	33%	35%	36%	17%	100%
Supermarket	80%	33%	36%	**47%**	50%	67%	**47%**	**41%**	17%	0%
Grand Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%



Interest in craft beer vs Place to buy beer

Place to buy beer	How interested are you in craft beer?							Grand Total
	1	2	3	4	5	6	7	
Duty free shop/ou	1	1	1	1	8	5	2	19
Restaurant/bar		2	4	3	8	12	7	36
Supermarket		1	3	7	8	11	14	44
Grand Total	1	4	8	11	24	28	23	99

Place to buy beer	How interested are you in craft beer?							**Total Score**
	Not interested	Not quite interested	Neither interested nor disinterested	Quite interested	Interested	Highly interested	Extremely interested	
Duty free shop/ou	100%	25%	13%	9%	33%	18%	9%	**5.25**
Restaurant/bar	0%	50%	50%	27%	33%	43%	30%	**5.52**
Supermarket	0%	25%	38%	64%	33%	39%	61%	**5.31**
Grand Total	100%	100%	100%	100%	100%	100%	100%	


Interest in Craft Beer vs Place to Purchase Beer
100%
80%
60%
40%
20%
0%
Not interested
Not quite interested
Neither interested nor disinterested
Quite interested
Interested
Highly interested
Extremely interested
How interested are you in craft beer?
Duty free shop/outside Finland
Restaurant/bar
Supermarket

Q1How often relatively do you drink beer?

Row Labels	Count of Q1How often relatively do you drink beer?
More than once a week	18
Once a month	19
Once a week	33
Once in two weeks	29
Grand Total	**99**

Count of Q2Mark your gender.	Column I		
Row Labels	Female	Male	Grand Total
More than once a week	2	16	18
Once a month	11	8	19
Once a week	11	22	33
Once in two weeks	10	19	29
Grand Total	**34**	**65**	**99**

Count of Q3Where do you mostly purchase beer?	Column I			
Row Labels	Duty free shop/outside Finland	Restaurant /bar	Supermarket	Grand Total
More than once a week	3	4	11	18
Once a month	5	8	6	19
Once a week	6	11	16	33
Once in two weeks	5	13	11	29
Grand Total	**19**	**36**	**44**	**99**

Count of Q4Who do you usually invite for a beer?	Column I			
Row Labels	Both	Female friends	Male friends	Grand Total
More than once a week	10	3	5	18
Once a month	7	5	7	19
Once a week	22	6	5	33
Once in two weeks	10	6	13	29
Grand Total	**49**	**20**	**30**	**99**

Count of Q5What is your favourite type of beer?	Column I											
Row Labels		American ales	American lagers	Belgian ales	Check lagers	English ales	German ales	German HeFeWeizen	German lagers	Irish ales	Scottish ales	Grand Total
More than once a week	1	3	2	1	3	1	1	2	3	1		18
Once a month			1	2	4	1		5	4	1	1	19
Once a week		2	3	3	9	2	1	5	7	1		33
Once in two weeks	1		3	5	1	2	1	5	8	3		29
Grand Total	**2**	**5**	**9**	**11**	**17**	**6**	**3**	**17**	**22**	**6**	**1**	**99**

Count of Q6How interested are you in craft beer?	Column I							
Row Labels	1	2	3	4	5	6	7	Grand Total
More than once a week		2	3	1	2	5	5	18
Once a month			3		7	7	2	19
Once a week		2		6	9	7	9	33
Once in two weeks	1		2	4	6	9	7	29
Grand Total	**1**	**4**	**8**	**11**	**24**	**28**	**23**	**99**

Q2Mark your gender

Row Labels	Count of Q2Mark your gender.
Female	34
Male	65
Grand Total	**99**

Count of Q1How often relatively do you drink beer?	Column I				
Row Labels	More than once a week	Once a month	Once a week	Once in two weeks	Grand Total
Female	2	11	11	10	34
Male	16	8	22	19	65
Grand Total	**18**	**19**	**33**	**29**	**99**

Count of Q3Where do you mostly purchase beer?	Column I			
Row Labels	Duty free shop/outside Finland	Restaurant /bar	Supermarket	Grand Total
Female	4	19	11	34
Male	15	17	33	65
Grand Total	**19**	**36**	**44**	**99**

Count of Q4Who do you usually invite for a beer?	Column I			
Row Labels	Both	Female friends	Male friends	Grand Total
Female	16	10	8	34
Male	33	10	22	65
Grand Total	**49**	**20**	**30**	**99**

Count of Q5What is your favourite type of beer?	Column I											
Row Labels		American ales	American lagers	Belgian ales	Check lagers	English ales	German ales	German HeFeWeizen	German lagers	Irish ales	Scottish ales	Grand Total
Female			2	5	6	2		9	7	2	1	34
Male	2	5	7	6	11	4	3	8	15	4		65
Grand Total	**2**	**5**	**9**	**11**	**17**	**6**	**3**	**17**	**22**	**6**	**1**	**99**

Count of Q6How interested are you in craft beer?	Column I							
Row Labels	1	2	3	4	5	6	7	Grand Total
Female		1	4	3	7	12	7	34
Male	1	3	4	8	17	16	16	65
Grand Total	**1**	**4**	**8**	**11**	**24**	**28**	**23**	**99**

Q3Where do you mostly purchase beer?

Row Labels	Count of Q3Where do you mostly purchase beer?
Duty free shop/outside Finland	19
Restaurant/bar	36
Supermarket	44
Grand Total	**99**

Count of Q1How often relatively do you drink beer?	Column I				
Row Labels	More than once a week	Once a month	Once a week	Once in two weeks	Grand Total
Duty free shop/outside Finland	3	5	6	5	19
Restaurant/bar	4	8	11	13	36
Supermarket	11	6	16	11	44
Grand Total	**18**	**19**	**33**	**29**	**99**

Count of Q2Mark your gender.	Column I		
Row Labels	Female	Male	Grand Total
Duty free shop/outside Finland	4	15	19
Restaurant/bar	19	17	36
Supermarket	11	33	44
Grand Total	**34**	**65**	**99**

Count of Q4Who do you usually invite for a beer?	Column I			
Row Labels	Both	Female friends	Male friends	Grand Total
Duty free shop/outside Finland	8	4	7	19
Restaurant/bar	19	8	9	36
Supermarket	22	8	14	44
Grand Total	**49**	**20**	**30**	**99**

Count of Q5What is your favourite type of beer?	Column I											
Row Labels		American ales	American lagers	Belgian ales	Check lagers	English ales	German ales	German HeFeWeizen	German lagers	Irish ales	Scottish ales	Grand Total
Duty free shop/outside Finland			1	2	3	1		3	5	4		19
Restaurant/bar		1	5	5	6	2	1	6	8	1	1	36
Supermarket	2	4	3	4	8	3	2	8	9	1		44
Grand Total	**2**	**5**	**9**	**11**	**17**	**6**	**3**	**17**	**22**	**6**	**1**	**99**

Count of Q6How interested are you in craft beer?	Column I							
Row Labels	1	2	3	4	5	6	7	Grand Total
Duty free shop/outside Finland	1	1	1	1	8	5	2	19
Restaurant/bar		2	4	3	8	12	7	36
Supermarket		1	3	7	8	11	14	44
Grand Total	**1**	**4**	**8**	**11**	**24**	**28**	**23**	**99**

Q4Who do you usually invite for a beer?

Row Labels	Count of Q4Who do you usually invite for a beer?
Both	49
Female friends	20
Male friends	30
Grand Total	**99**

Count of Q1How often relatively do you drink beer?	Column I				
Row Labels	More than once a week	Once a month	Once a week	Once in two weeks	Grand Total
Both	10	7	22	10	49
Female friends	3	5	6	6	20
Male friends	5	7	5	13	30
Grand Total	**18**	**19**	**33**	**29**	**99**

Count of Q2Mark your gender.	Column I		
Row Labels	Female	Male	Grand Total
Both	16	33	49
Female friends	10	10	20
Male friends	8	22	30
Grand Total	**34**	**65**	**99**

Count of Q3Where do you mostly purchase beer?	Column I			
Row Labels	Duty free shop/outside Finland	Restaurant/bar	Supermarket	Grand Total
Both	8	19	22	49
Female friends	4	8	8	20
Male friends	7	9	14	30
Grand Total	**19**	**36**	**44**	**99**

Count of Q5What is your favourite type of beer?	Column I											
Row Labels		American ales	American lagers	Belgian ales	Check lagers	English ales	German ales	German HeFeWeizen	German lagers	Irish ales	Scottish ales	Grand Total
Both		3	6	6	8	4	2	6	10	4		49
Female friends	1		1	2	4	2		7	2	1		20
Male friends	1	2	2	3	5		1	4	10	1	1	30
Grand Total	**2**	**5**	**9**	**11**	**17**	**6**	**3**	**17**	**22**	**6**	**1**	**99**

Count of Q6How interested are you in craft beer?	Column I							
Row Labels	1	2	3	4	5	6	7	Grand Total
Both		2	4	5	13	14	11	49
Female friends			1	2	6	7	4	20
Male friends	1	2	3	4	5	7	8	30
Grand Total	**1**	**4**	**8**	**11**	**24**	**28**	**23**	**99**

Q5What is your favourite type of beer?	
Row Labels	**Count of Q5What is your favourite type of beer?**
	2
American ales	5
American lagers	9
Belgian ales	11
Check lagers	17
English ales	6
German ales	3
German HeFeWeizen	17
German lagers	22
Irish ales	6
Scottish ales	1
Grand Total	**99**

Count of Q1How often relatively do you drink beer?	Column L				
Row Labels	**More than once a week**	**Once a month**	**Once a week**	**Once in two weeks**	**Grand Total**
	1			1	2
American ales	3		2		5
American lagers	2	1	3	3	9
Belgian ales	1	2	3	5	11
Check lagers	3	4	9	1	17
English ales	1	1	2	2	6
German ales	1		1	1	3
German HeFeWeizen	2	5	5	5	17
German lagers	3	4	7	8	22
Irish ales	1	1	1	3	6
Scottish ales		1			1
Grand Total	**18**	**19**	**33**	**29**	**99**

Count of Q2Mark your gender.	Column L		
Row Labels	**Female**	**Male**	**Grand Total**
		2	2
American ales		5	5
American lagers	2	7	9
Belgian ales	5	6	11
Check lagers	6	11	17
English ales	2	4	6
German ales		3	3
German HeFeWeizen	9	8	17
German lagers	7	15	22
Irish ales	2	4	6
Scottish ales	1		1
Grand Total	**34**	**65**	**99**

Count of Q3Where do you mostly purchase beer?	Column L			
Row Labels	Duty free shop/outside Finland	Restaurant /bar	Supermarket	Grand Total
			2	2
American ales		1	4	5
American lagers	1	5	3	9
Belgian ales	2	5	4	11
Check lagers	3	6	8	17
English ales	1	2	3	6
German ales		1	2	3
German HeFeWeizen	3	6	8	17
German lagers	5	8	9	22
Irish ales	4	1	1	6
Scottish ales		1		1
Grand Total	**19**	**36**	**44**	**99**

Count of Q4Who do you usually invite for a beer?	Column L			
Row Labels	Both	Female friends	Male friends	Grand Total
		1	1	2
American ales	3		2	5
American lagers	6	1	2	9
Belgian ales	6	2	3	11
Check lagers	8	4	5	17
English ales	4	2		6
German ales	2		1	3
German HeFeWeizen	6	7	4	17
German lagers	10	2	10	22
Irish ales	4	1	1	6
Scottish ales			1	1
Grand Total	**49**	**20**	**30**	**99**

Count of Q6How interested are you in craft beer?	Column L							
Row Labels	1	2	3	4	5	6	7	Grand Total
				1			1	2
American ales		1		1			3	5
American lagers	1		1		3	3	1	9
Belgian ales			1	1	2	3	4	11
Check lagers		1	2	5	3	4	2	17
English ales		1			2	3		6
German ales						1	2	3
German HeFeWeizen			1	1	2	8	5	17
German lagers		1	3	2	9	3	4	22
Irish ales					3	2	1	6
Scottish ales						1		1
Grand Total	**1**	**4**	**8**	**11**	**24**	**28**	**23**	**99**

Q6How interested are you in craft beer? (0=really not interested, 7=extremely interest					
Row Labels	Count of Q6How interested are you in craft beer?				
1	1				
2	4				
3	8				
4	11				
5	24				
6	28				
7	23				
Grand Total	99				

Count of Q1How often relatively do you drink beer?	Column L				
Row Labels	More than once a week	Once a month	Once a week	Once in two weeks	Grand Total
1				1	1
2	2		2		4
3	3	3		2	8
4	1		6	4	11
5	2	7	9	6	24
6	5	7	7	9	28
7	5	2	9	7	23
Grand Total	18	19	33	29	99

Count of Q2Mark your gender.	Column L			
Row Labels	Female	Male	Grand Total	
1		1	1	
2	1	3	4	
3	4	4	8	
4	3	8	11	
5	7	17	24	
6	12	16	28	
7	7	16	23	
Grand Total	34	65	99	

Count of Q3Where do you mostly purchase beer?	Column L			
Row Labels	Duty free shop/outside Finland	Restaurant /bar	Supermarket	Grand Total
1	1			1
2	1	2	1	4
3	1	4	3	8
4	1	3	7	11
5	8	8	8	24
6	5	12	11	28
7	2	7	14	23
Grand Total	19	36	44	99

Count of Q4Who do you usually invite for a beer?	Column L			
Row Labels	Both	Female friends	Male friends	Grand Total
1			1	1
2	2		2	4
3	4	1	3	8
4	5	2	4	11
5	13	6	5	24
6	14	7	7	28
7	11	4	8	23
Grand Total	49	20	30	99

Count of Q5What is your favourite type of beer?	Column L											
Row Labels		American ales	American lagers	Belgian ales	Check lagers	English ales	German ales	German HeFeWeizen	German lagers	Irish ales	Scottish ales	Grand Total
1				1								1
2			1			1	1		1			4
3				1	1	2			1	3		8
4		1	1		1	5			1	2		11
5				3	2	3	2		2	9	3	24
6				3	3	4	3	1	8	3	2	1 28
7		1	3	1	4	2		2	5	4	1	23
Grand Total		2	5	9	11	17	6	3	17	22	6	1 99

Appendix 6. Financial statements

Equipment cost calculation

Item	Price EUR	Depreciation Period	n Per year
Brewing system	100000	15 years	6666.666667
Cleaning equipment	2000	5 years	400
Bottling system	12500	5 years	2500
Laboratory equipment	7900	5 years	1580
Office furniture	15000	5 years	3000
Bottle washer	300	10 years	300
Bottles	5600	5 years	1120
PC + software	3000	5 years	600
Van	4900	10 years	490
Total	151200		16656.66667

Supplies calculation

Ingredient, other	amount per brew	cost per brew	weekly cost (2 brews per week)	monthly cost (8 brews per month)	yearly cost
Yeast	30	75	150	600	7200
Malt	128	184	368	1472	17664
Hops	0.85	75	150	600	7200
Water	313	353.69	707.38	2829.52	33954.24
Additional ingred.	2.3	50	100	400	4800
Corks	1515	70	140	560	6720
Ph stabilizer	0.5	15	30	120	1440
Total		822.69	1645.38	6581.52	78978.24

Need of money		
Investments	151200	
Insurance	4800	
Licence	3150	
Inventory	10000	
Training of staff	27000	
Rent deposit	10000	
Total need of money	**206150**	
Financed by		
Bank loan	150000	
Equity	56150	Share capital
Total financing	**206150**	

INCOME STATEMENT FORECAST					
Price per bottle (excl VAT)	4				
Price per bottle (incl VAT)	5				
Max capacity	145455				
	YEAR 1	50% sold	60% sold	70% sold	90%
		72727	87273		
	Revenue	**290909**	**349091**	**407273**	**523636**
	Cost of sales	39489	47387	55285	71080
	Gross Profit	**251420**	**301704**	**351988**	**452556**
	Payroll (3*4500*12)	162000	162000	162000	162000
	Rent (12*5000)	60000	60000	60000	60000
	Insurance (400*12)	4800	4800	4800	4800
	Equipment depreciation	16657	16657	16657	16657
	Control fee	900	900	900	900
	Electricity and water (1000*12)	12000	12000	12000	12000
	Total operating expenses	256357	256357	256357	256357
	Operating income	-4937	45347	95631	196199
	Interest	3000	3000	3000	3000
	Income before taxes	-7937	42347	92631	193199
	Income tax (20%)	0	8469	18526	38640
	Net income	**-7937**	**33878**	**74105**	**154559**
	Break even point (revenue)	337434.9			
	Break even point (units sold)	84358.73			
	Break even point (%% sold)	58%			

BEP calculation	Month	Year	%	per bottle
Revenue		**337434.9**	**100%**	**4**
Variable costs (Cost of sales)		78978.24	**23%**	**0.936219**
Contribution Margin		**258456.7**	**77%**	**3.063781**
Depreciation		16656.67		
Fixed costs - payroll	13500	162000		
Fixed costs - rent	5000	60000		
Fixed costs - Electricity and water	1000	12000		
Other fixed		7800		
Profit before taxes	0	0		
BEP (euros per bottle if we sell 100%	2.319864983			

Income statement for 10 years

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Revenue	523636	534109	544791	555687	566801	578137	589700	601494	613523	625794
Cost of sales	71080	72502	73952	75431	76940	78479	80048	81649	83282	84948
Gross Profit	452556	461607	470839	480256	489861	499658	509652	519845	530241	540846
Payroll (3*4500*12)	162000	165240	168545	171916	175354	178861	182438	186087	189809	193605
Rent (12*5000)	60000	61200	62424	63672	64946	66245	67570	68921	70300	71706
Insurance (400*12)	4800	4896	4994	5094	5196	5300	5406	5514	5624	5736
Control fee	900	918	936	955	974	994	1014	1034	1054	1076
Equipment depreciation	16657	16657	16657	16657	16657	16657	16657	16657	16657	16657
Electricity and water (1000*12)	12000	12240	12485	12734	12989	13249	13514	13784	14060	14341
Total operating expenses	255457	261151	266041	271028	276116	281305	286598	291997	297503	303120
Operating income	189201.5	200456	204799	209228	213745	218353	223054	227848	232738	237726
Interest	3000	2700	2400	2100	1800	1500	1200	900	600	300
Income before taxes	186201.5	197756	202399	207128	211945	216853	221854	226948	232138	237426
Income tax (20%)	38640	39551	40480	41426	42389	43371	44371	45390	46428	47485
Net income	139651.1	158205	161919	165702	169556	173483	177483	181558	185710	189941

	Capital	150000		
	Repayment	Interest	Total paymen	Balance in the er
Y1	15000	3000	18000	135000
Y2	15000	2700	17700	120000
Y3	15000	2400	17400	105000
Y4	15000	2100	17100	90000
Y5	15000	1800	16800	75000
Y6	15000	1500	16500	60000
Y7	15000	1200	16200	45000
Y8	15000	900	15900	30000
Y9	15000	600	15600	15000
Y10	15000	300	15300	0

CASH FLOW (Estimation of 90% sold)										
Receipts	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
Revenue	523636	534109	544791	555687	566801	578137	589700	601494	613523	625794
Capital investment (bank loan	150000									
Equity from owners	56150									
Total receipts	**729786**	534109	544791	555687	566801	578137	589700	601494	613523	625794
Payments:										
Supplies purchase	78978	71080	72502	73952	75431	76940	78479	80048	81649	83282
Control fee	900	918	936	955	974	994	1014	1034	1054	1076
Equipment purchase	151200					9200				
Dividents	40000	40800	40800	40800	40800	40800	40800	40800	40800	40800
Payroll (3*4500*12)	162000	165240	168545	171916	175354	178861	182438	186087	189809	193605
Rent (13*5000)	60000	61200	62424	63672	64946	66245	67570	68921	70300	71706
Insurance (400*12)	4800	4896	4994	5094	5196	5300	5406	5514	5624	5736
Electricity and water (1000*11	11000	11220	11444	11673	11907	12145	12388	12636	12888	13146
Bank loan repayment	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
Interest payment	3000	2700	2400	2100	1800	1500	1200	900	600	300
Total payments	526878	373054	379046	385162	391408	406984	404293	410939	417724	424651
Net cashflow	202908	161055	165746	170525	175393	171153	185406	190554	195799	201143
Opening bank	5000	207908.1	368962.8	534708.6	705233.3	880626.4	1051779	1237186	1427740	1623539
Closing bank	207908	368963	534709	705233	880626	1051779	1237186	1427740	1623539	1824682