



ALCOTimes™



DECEMBER 2023



BALAJI ENZYME & CHEMICAL PVT LTD

Akshay Mittal Industrial Estate
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E-mail : info@becpl.in | Web. : www.becpl.in

Introducing AlcoTimes :

We **Balaji Enzymes & Chemical Pvt Ltd** are sharing our monthly newsletter **ALCOTIMES** for Alcohol Industry. Now we are happy to launch our new monthly news letter "ALCOTIMES" for Alcohol Industry.

About Our Company :

We **M/s Balaji Enzyme & Chemical Pvt Ltd** are a leading supplier of Enzymes, Filter aid, Yeast, Hops, Processing aids, Clarifiers and food fortification products to breweries, distilleries, malt extract industry, starch industry, juice and beverage industry, and other food industry.





BALAJI ENZYME AND CHEMICAL PVT LTD

GRAIN AND MOLASSES DISTILLERY ENZYMES AND ANTIBACTERIAL SOLUTIONS



OUR PRODUCTS

Through innovations and advanced technologies, we want to provide excellent services and build long-term relationships with our esteemed customers

THE BEST SERVICE

We intend to provide our customers the best quality services that exceed the expectations. To be the best in the industry by providing enhanced services, relationship, innovative measures and profitability.

GRAIN DISTILLERY

1

SUPER AMYLASE DX

Thermostable Alpha Amylase

2

SUPER GLUCOAMYLASE

Glucoamylase

3

VITAHOP C

Hop Based Natural Antibacterials

4

SUPER ALCOBOOST G

Antibacterials Solutions

MOLASSES DISTILLERY

1

SUPER ALCOBOOST M

Antibacterials Solutions

Contact Us



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info@becpl.in



www.becpl.in



**Akshay Mittal Industrial Estate
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Mumbai - 400059,
Maharashtra, India**



SUPERAMYLASE DX

Thermostable Alpha Amylase

Description

SuperAmylase DX is a kind of thermostable α -amylase with high activity. It is derived from *Bacillus licheniformis* and produced through submerged fermentation and refining process. It can hydrolyse α -1,4 glycosidic bond of starch randomly and reduces mash viscosity rapidly. SuperAmylase DX Alpha-amylase is designed for starch-based feedstock ethanol production

Characteristics

Component name : Alpha amylase

Activity : ≥ 150000 U/g

Color : Amber

Physical form : Liquid

Approx. density g/ml : 1.10-1.25

Enzyme	DS	Brix	Reducing sugar	Iodine test	Viscosity/cp
Benchmark	1:2.8	23.0	3.06	Brown to red	283
SuperAmylase DX	1:2.8	23.4	3.08	Brown to Red	224

pH:4.85, Dosage: 12u/g, Temp/Time: 90°C/120 min

Advantages

For ethanol producer, smooth running and high starch conversion rate are extremely important to achieve high ethanol yields. Super Amylase DX may become an ideal solution to meet your targets. The advantages are as follows:

- Outstanding viscosity reduction performance
- Easier liquefaction handling with wide pH and temperature range
- Complete starch conversion to enhance ethanol yields

Recommendation

Material/water ratio : 1:1.8-1:3 (Optimum ratio 1:2-1:2.7)

pH range : 4.8-6.5 (Optimum : 5.0 to 6.0)

Temperature range : 65-100 °C (Optimum : 75 to 95 °C)

Cooking time : 90 to 120 mins

Dosage (kg/t Starch) : 0.10-0.15 kg/T

The actual dose required will depend upon the conditions of your fermentation: time, initial pH and the level of solids.

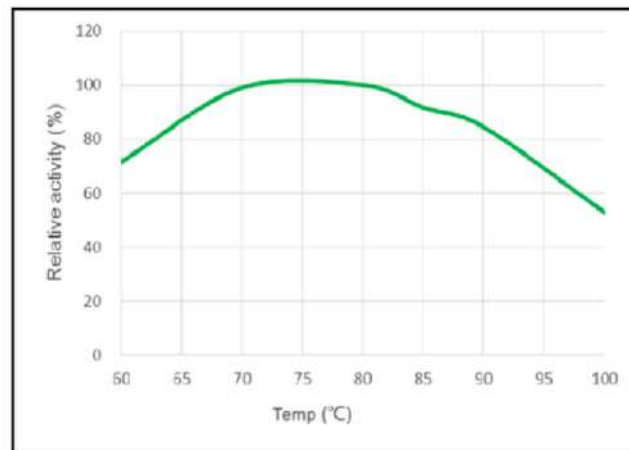


Fig. 1 : The influence of temperature on the activity of Super Amylase DX

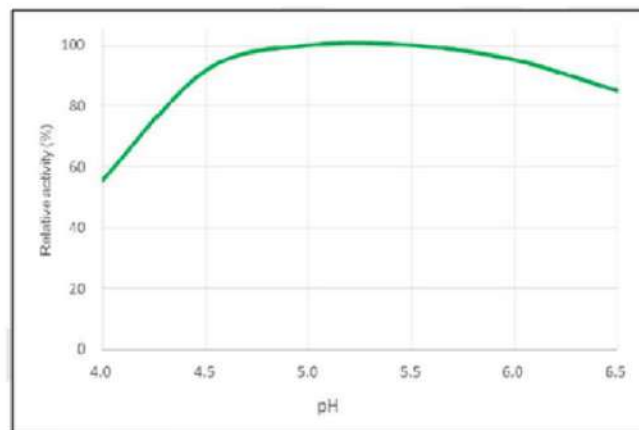


Fig. 2 : The influence of pH on the activity of Super Amylase DX

Composition

Preservatives : Potassium sorbate

Stabilizers : Sorbitol

Sodium chloride

Balaji Enzyme & Chemical Pvt Ltd

Rahul Mittal Industrial ,Premises Co. Op.
Society Ltd No 230, 2nd Floor, Building NO. 3,
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SUPERAMYLASE DX

Thermostable Alpha Amylase

Packaging

Available in various package sizes. Please consult Our representative for detailed information.

Safety and Handling precaution

Enzymes are proteins. Inhalation of dust or aerosols may induce sensitization and may cause allergic reactions in sensitized individuals. Some enzymes may irritate the skin, eyes, and mucous membranes upon prolonged contact. See the MSDS or Safety Manual for further information regarding safe handling of the product and spills.

Storage and Shelf life

Recommended storage: 0-25 °C Packaging must be kept intact, dry, and away from sunlight. Please follow the recommendations and use the product before the best before date to avoid the need for a higher dosage. To ensure maximum retention of activity, please keep the enzyme under refrigerated conditions below 5 °C with the container closed.

Best before: You will find the best before date in the certificate of analysis or on the product label. The product can be transported at ambient temperature. Following delivery, the product should be stored as recommended



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SUPER GLUCOAMYLASE

Glucoamylase

Description

Super Glucoamylase is the exo-glucoamylase derived from a *Aspergillus niger* with extremely high enzyme activity and sugar conversion rate, which can efficiently hydrolyze α -1,4-glucosidic bonds from the nonreducing end of liquefied starch to produce glucose quickly. Super Glucoamylase Alpha-amylase is designed for starch-based feedstock ethanol production

Characteristics

Component name : Glucoamylase

Activity : 400,000 U/g

Color : Amber

Physical form : Liquid

Approximate density g/ml : ≤ 1.20

Advantages

For ethanol producer, smooth running and high starch conversion rate are extremely important to achieve high ethanol yields. The advantages are as follows:

- Release glucose quickly and smoothly, the successive glucose providing favorable conditions for alcohol production.
- Optimize fermentation time and improve the utilization rate of equipment.
- Stable production performance with wide pH and Temperature range.
- Utilized in saccharification and can achieve high DX value.
- Wide pH stability, flexibility in process control.
- Saccharification can be processed in higher temperature and drier substance concentrations.

Composition

Enzyme : Glucoamylase

Stabilizers : Glucose

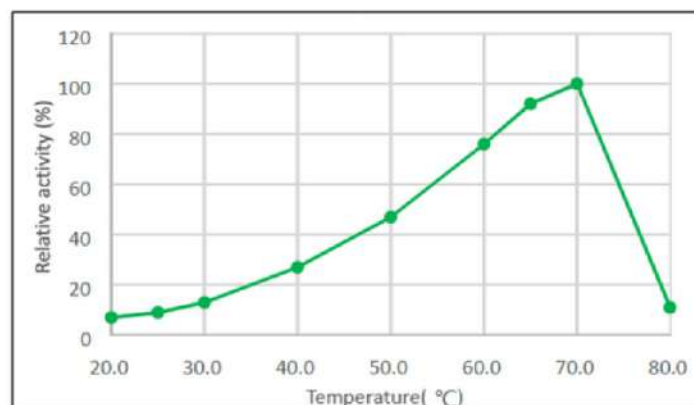


Fig. 1 The influence of temperature on the relative activity of Super Glucoamylase

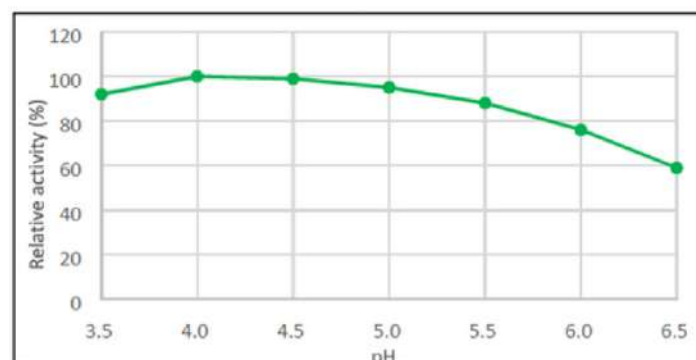


Fig. 2 The influence of pH on the relative activity of Super Glucoamylase

Recommendation

Material/water ratio: 1:1.4-1:3.0

(Optimum ratio 1:1.6 to 1:2.4)

pH range : 4.0-5.0 (Optimum : 4.1 to 4.5)

Temperature range : 30-70 °C (Optimum : 55 to 65 °C)

Dosage (kg/t Starch): 0.4-0.6 kg/T

The actual dose required will depend upon the conditions of your fermentation: time, initial pH and the level of solids.



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Glucoamylase

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Enzymes are proteins. Inhalation of dust or aerosols may induce sensitization and may cause allergic reactions in sensitized individuals. Some enzymes may irritate the skin, eyes, and mucous membranes upon prolonged contact. See the MSDS or Safety Manual for further information regarding safe handling of the product and spills.

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Best before: You will find the best before date in the certificate of analysis or on the product label.

The product can be transported at ambient temperature.

Following delivery, the product should be stored as recommended.



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Vitahop®

**Increase profits in
BIOETHANOL...naturally**

Vitahop® is a range of natural hop extracts, ideal for production of bioethanol from a range of raw material feedstocks, as they protect yeast from bacterial growth, and their acid by-products, during fermentation processes. When used as part of a planned process regime with regular additions, bacterial infections do not develop and spoil yeast fermentations.

When infections do develop, they can quickly get out of control and disrupt production, potentially causing substantial losses and lost revenue. By controlling bacteria and preventing bacterial growth, catastrophic infections can be a thing of the past.

Vitahop® is used in both continuous and batch fermentations. It helps ensure healthy, vitalised yeast growth and during fermentation suppress gram positive bacteria. If bacteria are allowed to prosper, they will compete with and eventually inhibit the yeast, slowing fermentation sometimes to a complete stop, resulting in a “stuck” fermentation. Bacteria will also use up valuable feedstock producing organic acids such as lactic acid, further reducing ethanol yields. Prevent this happening with **Vitahop®**.

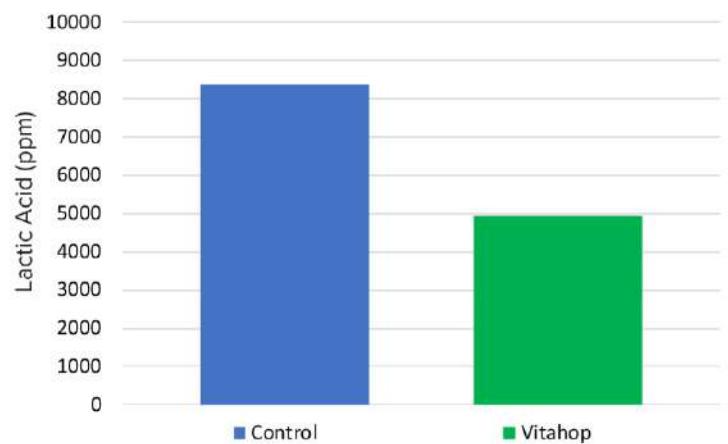


Key Benefits of Vitahop®

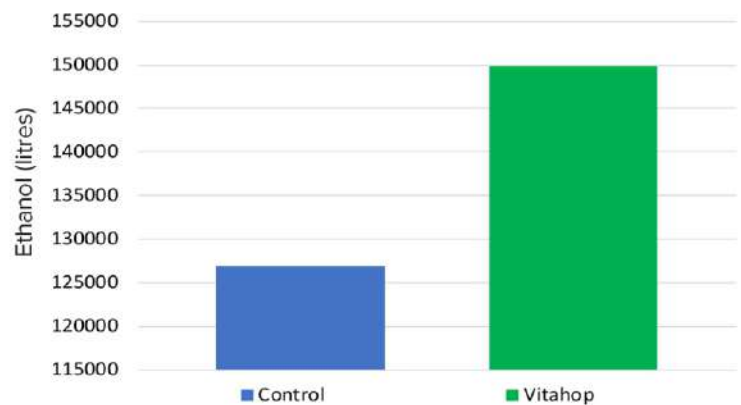
- Maintains optimum ethanol yields
- Ensures reliable fermentations
- Keeps yeast healthy
- Controls bacteria
- Demonstrated benefits in ethanol production plants worldwide
- Safe and natural, easy to use
- Safe DDGS for animal feed
- A natural alternative to antibiotics



Effect of Vitahop® on Average Lactic Acid Production at Fermenter Drop



Effect of Vitahop® on Ethanol Production



Unpublished data BetaTec 2015



BetaTec is the first company worldwide specialising in the application of hops and hop-derived compounds for use in “beyond brewing” industries. Our product portfolio includes natural fermentation aids, antibacterials, flavours and functional ingredients. Our key business areas are alcohol, yeast and sugar production.

All BetaTec products are accompanied by on-site support, process optimisation and consulting.

Please contact our technical experts to learn how Vitahop® can help you sustain improved ethanol yields.

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5185 MacArthur Blvd NW, Suite 300
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Malvern Hills Science Park
Geraldine Road
Great Malvern, Worcestershire WR14 3SZ
+44(0) 1684 217340

BetaTec® 
hop products

“Transforming your world with our natural hop solutions”



SUPER ALCOBOOST G

Grain ethanol biocide

Description

Super Alcoboost G is a powerful solid biocide in powder form that protects yeast, sugar, and alcohol by removing bacteria from wort/wash. It improves alcohol quality by reducing acid formation caused by harmful lactic acid bacteria during grain ethanol production. It also benefits microorganisms during the biomethanation process.



Advantages

Super Alcoboost G provides the following benefits:

- Reduction of yeast stress & Increased alcohol yields
- Reduces sucrose losses due to contamination
- Reduces bacterial contamination very rapidly
- Prevention of bacterial competition for glucose



Dosages

5-10 PPM in the wort prior to pitching the yeast culture, and the same dose after filling the fermenter.

We recommend 6 PPM or 600 gram per 1.00 lac litre of wort / wash for grain.

Before mixing to bulk volume in the pre fermenter and fermenter, Super Alcoboost G should be dissolved in wort / wash in a bucket. (It is readily dissolved in water, wort & wash)

Balaji Enzyme & Chemical Pvt Ltd

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SUPER ALCOBOOST G

Grain ethanol biocide

Product application

PRE FERMENTER

Dosing/application begins in the pre fermenter. Super Alcoboost G should be added as soon as 10% of the wort is transferred to the pre fermenter.

Example-

If the pre fermenter capacity is 2 lacs litres, then Super Alcoboost G should be added for full capacity as soon as 20,000 litres of wort are transferred to PF @ 600 gm per 01 lac litre, i.e. 1.2 kg Super Alcoboost G should be dissolved by hand in the same wort in a bucket & put it to PF now PF should be filled normally. (The operator must wear gloves and goggles).

FERMENTER

Super Alcoboost G should be added to the fermenter as soon as 10% of the wort is transferred/reaches the fermenter.

Example-

We presume only one fermenter of 12 lac litre in capacity.

In this case, the total amount of Super Alcoboost G should be added as soon as 10% (1,20,000 ltr) of wort/wash is transferred to the fermentation tank, i.e. @ 600 gm/one lac litre x 12 = 7.2 kg, and then the fermenter should be filled normally.

Packaging

12 Kg carton (12 sealed plastic jars - 1 Kg each)

Safety ,Handling and storage precaution

Store in a cool, dry place. Nobody should try to smell or taste anything. Hand gloves are advised to be worn when handling.

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SUPER ALCOBOOST M

Molasses ethanol biocide

Description

Super Alcoboost M is a powerful solid biocide in powder form that protects yeast, sugar, and alcohol by removing bacteria from wort/wash. It improves alcohol quality by reducing acid formation caused by harmful lactic acid bacteria during grain ethanol production. It also benefits microorganisms during the biomethanation process.



Advantages

Super Alcoboost M provides the following benefits:

- Reduction of yeast stress & Increased alcohol yields
- Reduces sucrose losses due to contamination
- Reduces bacterial contamination very rapidly
- Prevention of bacterial competition for glucose



Dosages

5-10 PPM in the wort prior to pitching the yeast culture, and the same dose after filling the fermenter.

We recommend 6 PPM or 600 gram per 1.00 lac litre of wort / wash for grain.

Before mixing to bulk volume in the pre fermenter and fermenter, Super Alcoboost M should be dissolved in wort / wash in a bucket. (It is readily dissolved in water, wort & wash)



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SUPER ALCOBOOST M

Molasses ethanol biocide

Product application

PRE FERMENTER

Dosing/application begins in the pre fermenter. Super Alcoboost M should be added as soon as 10% of the wort is transferred to the pre fermenter.

Example-

If the pre fermenter capacity is 2 lacs litres, then Super Alcoboost M should be added for full capacity as soon as 20,000 litres of wort are transferred to PF @ 600 gm per 01 lac litre, i.e. 1.2 kg Super Alcoboost M should be dissolved by hand in the same wort in a bucket & put it to PF now PF should be filled normally. (The operator must wear gloves and goggles).

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Example-

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B K GOEL

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Ph.: 8962405107, 8889939879

CONSULTANTS FOR DISTILLERY & BOTTLING FACILITY

We are a team headed by Mr. B K Goel (Consultant)
for below Projects/Jobs.

1. Setting up a distillery unit For Ethanol & ENA.
2. Setting up a bottling unit for manufacturing of Alcoholic Liquors such as Rum, Whisky, Gin, Brandy, Vodka & RTD.
3. Setting up the Malt Spirit Plants producing the quality as Vatted Malt Spirit.
4. Blending / Development of various liquor brands up to highest Level.
5. We also take annual contract to blend all the Alcoholic products of all range.

May Please Contact

B K GOEL

goelbk20@gmail.com

Ph. 8962405107, 8889939879



How to improve shelf life of molasses



B K GOEL

Consultant for distillery and
bottling facility

Till some time ago it was difficult to prevent the deterioration of molasses after storage in steel tanks in sugar mills or in distilleries.

In fact reduction / deterioration starts in TRS of molasses after 3 – 4 months of storage.

Deterioration of sugar in higher brix (say 90 or more)molasses starts after 5 – 6 months as propagation of bacteria is difficult in thick molasses due to osmosis.

Khandsari molasses should be consumed as soon as it is produced due to low brix say around 55 deg.only.

In case the khandsari molasses is stored for a longer period ie around 6 months or more then it is almost impossible to protect it from contamination .

But now it has become possible with a guarantee to save the sugar in molasses for a year or more.

For this one should use the anti bacterial compound .

Conference

Fuels of Future 2.0

"Converging Towards Greener Growth"

16th January 2024 – New Delhi

Why Attend

- Seize the opportunity to meet policy makers
- New information from leading industry experts
- Meet and greet international delegations and speakers
- Get a global outlook of the market
- Capitalize on new business opportunities
- Opportunity to meet multiple decision makers and end users
- Share experience for better utilization of blending & alternative fuels and raw materials

Option for Exhibition Area (2 x 2 sqft.)

Exhibit Profile

Power	Renewable Energy	Eco-Waste
■ Automation Technologies ■ Energy Saving Solution ■ Monitoring & Control Equipment Systems ■ Network & Security Solutions	■ Alternative Energy ■ Bio energy ■ Energy Conservation Products & Technologies ■ IOT & Digitalization ■ Pollution Prevention Solution ■ Solar ■ Waste to Energy Solutions ■ New Age fuels ■ Battery solution provider	■ Environmental Cleaning ■ Green Engineering & Environmental Technologies ■ Green Materials & Technology(Bioplastics) ■ Waste Recycling ■ Waste treatment & Disposal

Participation Charges: Standard Cost

2x2 Exhibition area charges with following inclusions: } **INR 50,000/-**
2 chair, Table, Counter, socket.

For Partnership, Sponsorship and other Opportunities, please contact:

Chirag Gupta

M: 8882004129 | E: chirag.gupta@assocham.com

The Associated Chambers of Commerce and Industry of India

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Sachin Mogal

Technical Manager (Alcohol),
Balaji Enzyme and Chemical Pvt Ltd

Heat and Hammer: How High Temperatures Impact DDGS Nutrition

You know the old saying—where there's smoke, there's fire. In the world of ethanol production, where there's fire, there's heat. And lots of it. The high temperatures required to produce ethanol from corn also produce a valuable co-product—distillers dried grains with solubles (DDGS). But what happens to the nutritional quality of DDGS when it's exposed to all that heat during production? Quite a bit, it turns out. New research shows the heat and humidity involved in the DDGS production process can significantly impact the nutritional composition of this livestock feed ingredient. The high temperatures break down nutrients, reduce digestibility, and may even produce unwanted byproducts. If you're buying or using DDGS, you'll want to understand how the heat of production hammers its nutritional value. This article digs into the research on heat and DDGS to help you make the most of this hot commodity.

What Is DDGS and How Is It Produced?

DDGS stands for distillers dried grains with solubles, a byproduct of ethanol production from corn. To make ethanol, corn kernels are ground and mixed with water to form a mash. Enzymes and yeast are added to convert the starch to sugar, and then alcohol. After the mash ferments, the solids remaining contain protein, fiber, fat, and minerals. This leftover grain mash is dried and sold as DDGS, a nutritious livestock feed supplement. DDGS provides energy, protein, and phosphorus for beef and dairy cattle, swine, and poultry.

The drying process uses high heat to remove moisture from the grains, but this can impact some nutrients. Excessive heat may damage protein structures, amino acids, and B-vitamins. While drying is necessary to prevent spoilage, lower temperatures (around 176 F) are ideal. Higher temperatures above 203 F for prolonged periods can significantly reduce lysine and other amino acids, as well as natural B-vitamins.

To maximize nutrition, producers should closely monitor drying temperature and time. Shorter drying times and intermittent cooling periods help limit damage. Adding antioxidants like ethoxyquin or tert-butylhydroquinone (TBHQ) also helps protect nutrients. Proper storage in a cool, dry area away from sunlight prevents further loss.

When sourcing DDGS, consider the producer's drying process. Ask about typical drying temperatures and if antioxidants are added. Compare nutritional analyzes to determine quality and if temperature adjustments may be needed for your animals. With the right production methods, DDGS can be an excellent, affordable source of nutrition. But as with many things, moderation and quality are key.



DDGS

The Effect of High Temperatures on DDGS Nutrient Composition

When DDGS is produced at higher temperatures, it can impact the nutritional value. The heat essentially ‘cooks’ the nutrients, breaking them down and reducing their effectiveness.

Protein

Prolonged exposure to high heat during DDGS production can damage the amino acids that make up protein. The higher the temperature and the longer the duration, the more severe the effects. At extreme temperatures above 200°F, lysine and other amino acids start to break down significantly, lowering the overall protein quality and digestibility.

Fat

High heat also causes fat oxidation in DDGS, producing peroxides that make fats rancid and unstable. Rancid fats have a shorter shelf life and may produce undesirable flavors and odors. They also have a lower energy value, as the fats have already started to break down.

Vitamins

Vitamins are sensitive to heat, especially the B vitamins thiamine, riboflavin, niacin, and pantothenic acid. Prolonged exposure to temperatures over 150°F can destroy up to half the B vitamins in DDGS. Vitamin E, an important antioxidant, is also diminished with excess heat during production.

To maximize the nutritional value of DDGS, producers aim for the lowest drying and processing temperatures possible while still achieving a shelf-stable product. New technologies like flash drying and short residence time ovens can produce high-quality DDGS at lower temperatures. In the end, you want a product that maintains as much of the nutritional potential of the original corn as possible.

Changes in Protein Quality of DDGS at High Temperatures

High heat during DDGS production can negatively impact the protein quality of the final product. As temperatures rise, several undesirable changes occur:

Denaturation of Proteins

The high heat used during processing can cause the proteins in DDGS to denature, meaning their 3D structure is disrupted. This makes them less digestible for animals. Certain amino acids like lysine are particularly sensitive to heat and can be damaged, lowering the overall nutritional value of the protein.

Advanced Maillard Reaction Products

The Maillard reaction is a chemical reaction between amino acids and reducing sugars that gives browned food its distinctive flavor. However, at high enough temperatures, this reaction can produce advanced Maillard reaction products (MRPs) like acrylamide that are harmful and provide no nutritional value. MRPs have been shown to be carcinogenic and can reduce growth in some animals.

Reduced Amino Acid Availability

High heat processing has been shown to reduce the availability of certain amino acids in DDGS, especially the essential amino acids lysine, methionine, and threonine. These amino acids are critical for many functions, and a deficiency can lead to reduced growth and health issues. The overall crude protein content of DDGS may remain unchanged, but the quality and availability of that protein is reduced.

By controlling processing temperatures, especially during drying, producers can take steps to mitigate these negative impacts on DDGS nutrition. Careful monitoring and limiting maximum temperatures can help preserve protein quality, reduce MRP formation, and maintain amino acid availability. In some cases, additional lysine or other supplements may still be needed to offset heat-related losses, but temperature control remains the best first step.

Producers should aim for the lowest temperatures possible that still allow for efficient drying and preservation of the product. Finding the right balance - not too hot, not too cool - is key to optimizing DDGS protein quality and nutrition. Keeping the product as cool as you can during processing means animals will benefit from a higher-quality protein source that provides all the necessary amino acids for growth and health.

Impact on Digestible Amino Acids in DDGS

High heat during ethanol production can negatively impact the nutritional quality of DDGS. As temperatures rise, the amount of digestible amino acids in DDGS decreases. Amino acids are the building blocks of protein, so when they become less digestible, the protein quality and availability drops.

Lysine

Lysine is an essential amino acid for swine and poultry, but it is one of the most heat-sensitive. As temperatures increase during DDGS production, lysine digestibility can decrease by up to 50-70%. This makes the protein less useful for the animals consuming it. To maintain lysine levels, it's best to limit temperatures to around 300 F during the drying process. Using multi-stage dryers and avoiding over-drying the grains can also help.

Methionine

Another important amino acid, methionine, also loses digestibility at high heat. For every 50 F increase in temperature, methionine digestibility can drop by about 10-15% in DDGS. As with lysine, keeping temperatures moderate - ideally below 300 F - will minimize loss of this essential amino acid.

Other Amino Acids

Most amino acids lose some digestibility at the high temperatures used during DDGS production, though lysine and methionine are typically the most sensitive. In general, for every increase of 50-100 F during drying and processing, you can expect a 5-10% decrease in digestibility of most amino acids. Using efficient dryers that limit overheating, especially at the end stages of drying, can help combat loss of digestible amino acids and maintain the nutritional quality of DDGS. By controlling temperatures and the extent of heating during production, ethanol plants can produce DDGS with improved digestible amino acid content and better protein quality for use in animal feed. Keeping a close eye on this important factor will help optimize the feed value of DDGS.

Optimizing DDGS Nutritive Value During Production

When producing DDGS, controlling the temperature during processing is key to optimizing its nutritional value. The heat used can impact the digestibility of nutrients and availability of amino acids in the final DDGS product.

Monitor Temperature Carefully

The temperature reached during drying has a significant effect on DDGS quality. Higher temperatures, especially over 700°F, can damage nutrients and reduce digestibility. At lower temperatures, around 600°F, DDGS retains more of its nutritional value.

Controlling temperature is also important for producing a consistent, high-quality product. Fluctuating or spiking temperatures during drying can vary the nutritional makeup from batch to batch. Carefully monitoring and regulating the temperature will help produce a uniform product with stable nutrient levels.

Limit Moisture Early On

Removing moisture early in the drying process, when temperatures are lower, helps protect nutrients. As DDGS dries, its protein and other nutrients become more concentrated. If too much moisture is present at higher temperatures later in drying, it can be difficult to remove and may lead to 'scorching' that reduces digestibility.

Reducing moisture in the initial drying stages, at lower heat around 600°F, avoids over-drying later on and helps retain more nutrients. Starting the drying process with lower heat and humidity settings, then gradually increasing temperature as moisture decreases, optimizes nutritive value.

Test and Monitor Nutrient Levels

The only way to truly determine if production methods are maximizing DDGS nutrition is through nutrient testing. Compare different heat and moisture levels to see impacts on digestibility, amino acid availability, and macro- and micronutrient content. Make adjustments to find the right balance for your equipment and process.

Regular testing also helps monitor for variability and ensure a consistent, high-quality product. Look at multiple batches over time to determine normal ranges for different nutrients. If levels start to drop off or become erratic, it may indicate issues with temperature control or other production factors that need correction. Consistent testing is key to producing optimized DDGS.

Conclusion

Your hard-earned brewing mash is put through the ringer to become distillers dried grains with solubles, but the heat and pressure involved can impact its nutritional value. While ddgs has a lot going for it as animal feed, the high temperatures used can reduce protein quality and certain nutrients. The good news is ddgs still packs a nutritional punch, with studies showing it provides a good source of energy, protein, and phosphorus for livestock. For the best results, work closely with your nutritionist to determine the right amount of ddgs to include in feed rations based on the specific nutritional needs of your animals. The heat may be on during production, but with the right balance ddgs can be a hot commodity for your operation



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Unveiling Flavor Complexity: The Chemical Symphony of Barrel Aging for Single Malt Whiskeys



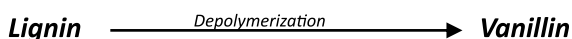
Rohit Chauhan

Introduction

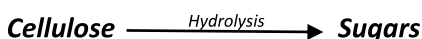
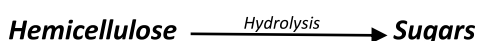
Single malt whiskey, a masterpiece of craftsmanship, owes much of its complexity to the chemical ballet orchestrated during barrel aging. This article delves into the art and science of barrel aging for single malt whiskeys, exploring the chemical reactions that shape the maturation process and contribute to the distinctive flavor profile of each spirit.

The Barrel Selection Process

The journey begins with meticulous barrel selection. Oak barrels, often crafted from American white oak or European oak, introduce essential compounds into the whiskey. Lignin, a complex polymer in oak, undergoes depolymerization, releasing vanillin, responsible for vanilla notes, and imparting a sweet aroma. This reaction can be represented as follows:



Simultaneously, hemicellulose and cellulose in the wood contribute sugars to the whiskey through hydrolysis:



Maturation Process and Environmental Factors

Environmental factors play a crucial role in the maturation process. Temperature fluctuations cause the whiskey to expand and contract within the barrel, facilitating the extraction of compounds from the wood. This thermal cycling, coupled with humidity changes, influences the rate of chemical reactions.

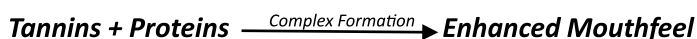


Chemical Transformations in Barrel Aging

The heart of barrel aging lies in the intricate chemical transformations between the spirit and the wood. Phenolic compounds from the wood, such as guaiacol, contribute smoky and spicy notes. Over time, guaiacol undergoes oxidation, transforming into compounds that impart complexity and depth:

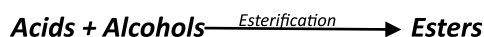


Meanwhile, tannins extracted from the wood contribute to mouthfeel and astringency. The interaction of tannins with proteins in the whiskey results in the formation of stable complexes, enhancing the overall texture:



The Role of Time in Barrel Aging

Time is a critical factor in barrel aging, influencing the extent of chemical reactions. During prolonged maturation, esters, formed through the reaction between acids and alcohols, contribute fruity and floral notes:



Conversely, prolonged aging can lead to undesirable over-oaked flavors as lignin degradation progresses.

Conclusion

Barrel aging is an intricate interplay of chemical reactions, where the spirit and the wood engage in a transformative dance. From depolymerization of lignin to the formation of esters, each reaction contributes to the rich tapestry of flavors found in single malts. As whiskey enthusiasts savor the nuanced complexity of a well-aged single malt, they are appreciating not only the craftsmanship but also the chemical symphony orchestrated within the confines of the oak barrel.



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"FROM MOLASSES TO DISTILLERY: UNVEILING THE ART OF CRAFTING SPIRITS"



Kanak lata

Introduction

In the intricate world of distillation, where alchemy meets craftsmanship, molasses stands out as a key player in the creation of some of the finest spirits. From rum to artisanal liqueurs, the journey from molasses to distillery is a fascinating exploration of flavors, tradition, and the meticulous artistry behind crafting exceptional libations. In this article, we delve into the process of transforming molasses into liquid gold and the diverse spirits that emerge from this unique ingredient.

Molasses Unveiled: The Sweet Essence of Distillation

Derived from the sugar refining process, molasses is a viscous, dark syrup that carries the concentrated sweetness of sugar cane. Its distinctive flavor profile, featuring rich notes of caramel, toffee, and a hint of earthiness, makes it an ideal base for crafting a variety of spirits.

The Distillation Dance: Turning Molasses into Spirits

Rum - The Essence of Molasses:

Fermentation: Molasses serves as the primary fermentable sugar for rum production. Yeast is introduced to the molasses, converting its sugars into alcohol during the fermentation process.

Distillation: The fermented molasses mash is then distilled, typically in pot stills or column stills, to separate alcohol from impurities. The resulting spirit is aged in barrels, allowing it to develop complex flavors and characteristics unique to each distillery.

Artisanal Liqueurs - Molasses' Versatility:

Infusion: Molasses provides a robust and versatile base for crafting artisanal liqueurs. It serves as a canvas for infusing various botanicals, spices, and fruits, allowing distillers to create a wide array of flavored spirits.

Distillation and Blending: After infusing the molasses base, distillation refines the spirit, and careful blending achieves the desired flavor profile. The result is a spectrum of liqueurs, from spiced and herbal to citrus-infused and beyond.

The Craft Distillery Renaissance: Embracing Molasses in Modern Spirits

In the midst of the craft distillery renaissance, small-batch producers are rediscovering the magic of molasses, using it as a canvas to express their creativity. Artisan distillers experiment with unique fermentation techniques, barrel aging, and botanical blends, producing spirits that showcase the depth and complexity achievable with molasses as a starting point.

Sustainability in Distilling: Molasses as a Green Choice

Beyond its flavor and versatility, molasses holds appeal for distillers committed to sustainable practices. As a byproduct of sugar production, molasses repurposes what might otherwise be considered waste, aligning with the ethos of environmental responsibility in modern distilling.

Conclusion:

From the molasses-rich fields to the copper stills of distilleries, the journey from molasses to the bottle is a testament to the creativity and dedication of distillers. Whether crafting a bold and robust rum or an intricately flavored liqueur, molasses stands as a foundational element in the art of distillation, offering a symphony of flavors that captivate the palates of spirits enthusiasts around the world. Cheers to the alchemists who turn molasses into liquid gold!

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Yeast, as a microorganism, is inherently capable of converting sugars into alcohol and carbon dioxide through the process of fermentation. However, there are distinctions between yeast strains used for non-alcoholic purposes and those used for alcoholic fermentation:

1. Non-Alcoholic Yeast:

- o **Baker's Yeast:** Baker's yeast, typically *Saccharomyces cerevisiae*, is used in baking to leaven bread, rolls, and other baked goods. In this context, the yeast's primary role is to produce carbon dioxide gas, which gets trapped in the dough, causing it to rise. The alcohol produced during fermentation in bread-making is minimal and evaporates during baking, leaving behind the characteristic flavor of the yeast and contributing to the bread's texture.
- o **Nutritional Yeast:** Nutritional yeast, such as *Saccharomyces cerevisiae* or *Candida utilis*, is used as a food supplement and flavor enhancer. It is a deactivated yeast, meaning it is no longer capable of fermentation. Nutritional yeast is prized for its umami flavor and is often used as a cheese substitute in vegan and vegetarian dishes. It is a rich source of B vitamins, particularly B12, as well as protein and other nutrients.

2. Alcoholic Yeast:

- o **Brewing Yeast:** Brewing yeast, also typically *Saccharomyces cerevisiae* or *Saccharomyces pastorianus*, is used in the production of alcoholic beverages such as beer and wine. These yeast strains are carefully selected and cultivated for their ability to efficiently convert sugars into alcohol and carbon dioxide while producing specific flavor and aroma compounds. The alcohol content is a critical factor in these processes, and the yeast's performance directly impacts the final product's flavor, alcohol content, and character.
- o **Distillers Yeast:** Distillers yeast strains, like those used in whiskey, vodka, and other spirit production, are chosen for their high alcohol tolerance and ability to ferment a wide range of sugars. They are optimized for maximizing alcohol production, and their characteristics can significantly influence the flavor of the distilled spirits.

In summary, yeast strains used for non-alcoholic purposes are typically deactivated or used in such a way that their alcohol production is negligible or irrelevant to the final product. In contrast, yeast strains used for alcoholic fermentation are selected and cultivated for their ability to efficiently convert sugars into alcohol while contributing to the unique flavor profiles of alcoholic beverages.



Alfa Laval Offers Turnkey Brewery Projects

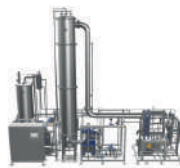
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MAMTA BHARDWAJ

**Business Development Manager
(Wine Industry)**

“If life gives you lemons, you should make lemonade. And try to find somebody who’s life gives them vodka, and have a party”. – Ron White

By definition, vodka is a distilled alcoholic beverage. Traditionally, it is made by distilling liquid from fermented cereal grains, and potatoes since introduced in Europe in the 1700s. But now a days some brands use corn, sugar cane, fruits, honey, and maple sap as the base.

The beverage is clear, with very minimal aroma and flavor notes. The European Union has established a minimum alcohol content of 37.5% for vodka. Vodka in the United States must have a minimum alcohol content of 40%.

While the name vodka is a diminutive of the Russian voda (“water”), the origins of the liquor are a matter of debate. Some claim that it originated as early as the 8th or 9th century in either Poland or Russia. Regardless of when or where it originated, a liquor called vodka was present in Russia during the 14th century.

The history of vodka traces back to Russia, Poland, and Sweden. Throughout the years, it has become one of the most popular types of alcohol of all time for the boost it gives to mixers. It remains the base liquor for many of the most popular cocktails in bars and restaurants.

Vodka is traditionally drunk “neat” (not mixed with water, ice or other mixers) and it is often served freezer chilled. It is usually the liquor of choice when creating a cocktail since it doesn’t disrupt the flavors of the other ingredients. Other alcoholic beverages like rum and whiskey have such a distinct flavor that they don’t always pair well with mixers.

Many consumers claim that vodkas made from potatoes are smoother, easier to drink, and offer a much better mouthfeel. It is also the healthier option, as it is gluten-free and has a low number of macronutrients. If you’re looking to drink vodka neat, opt for one derived from potatoes, as this kind of vodka typically has a greater flavor profile.

Some popular vodka cocktails are bloody mary, cosmopolitan, Vodka martini etc.
Cheers!!!

"FROM GRAINS TO GLASS: THE ART AND SCIENCE OF GRAIN DISTILLERIES"

Introduction

In the world of spirits, the journey from grains to glass represents an alchemical process where craftsmanship meets science. Grain distilleries, the epicenters of this transformative journey, play a pivotal role in producing a diverse array of spirits, from the classic warmth of whiskey to the smooth elegance of vodka. In this exploration, we delve into the intricacies of grain distilleries, uncovering the grains, processes, and skilled craftsmanship that shape these liquid masterpieces.

The Grains: A Symphony of Flavors:

Grain distilleries utilize a variety of grains, each contributing its unique flavors to the final spirit. Common grains include barley, corn, rye, and wheat, with the mash bill—a carefully crafted blend of grains—setting the stage for the spirit's character. The choice of grains and their proportions define the foundation of the distillation journey.

The Mashing Process: Unlocking Sugars:

The journey begins with mashing, a crucial step where grains are ground and mixed with hot water to extract fermentable sugars. This process activates enzymes in the grains, breaking down starches into sugars, creating a sweet liquid known as wort. The selection of grains and the mashing technique influence the flavor profile of the eventual spirit.

Fermentation: Transforming Wort into Wash:

The sweet wort undergoes fermentation, where yeast is introduced to convert sugars into alcohol. The resulting liquid, now called wash or beer, is the precursor to the distilled spirit. The length and conditions of fermentation impact the final flavor, aroma, and alcohol content of the wash.



Priyanshi Sharma

Distillation: The Alchemy of Transformation:

The heart of the grain distillery lies in the distillation process. The wash is heated, and the alcohol vapors are collected and condensed, separating impurities and concentrating flavors. Copper stills, a common choice for many distilleries, add their own influence, contributing to the complexity and smoothness of the final product.

Maturation: Time and Oak:

For spirits like whiskey, maturation is a critical phase. The distilled liquid, often referred to as "white spirit," is aged in oak barrels. This process imparts additional flavors, colors, and textures as the spirit interacts with the wood. The choice of barrel and the duration of aging profoundly influence the character of the final product.

Craftsmanship and Innovation:

Grain distilleries are hubs of craftsmanship and innovation. Master distillers and blenders carefully monitor and guide the entire process, making decisions that impact the spirit's unique qualities. Some distilleries embrace traditional methods, while others experiment with novel grains, barrel types, and aging techniques, pushing the boundaries of flavor exploration.

Conclusion

From the golden hues of aged bourbon to the crystal clarity of vodka, grain distilleries are the architects of a diverse and vibrant spirits landscape. The journey from grains to glass is a harmonious blend of tradition, innovation, and skill, creating liquid expressions that captivate the senses and tell the rich stories of the grains that lay at the heart of each bottle. As we raise our glasses, we toast to the art and science that transforms humble grains into extraordinary spirits. Cheers!

Unlocking Sweetness: The Art and Science of Sugarcane Syrup Preservation



Sales Executive
Rahul kumar jha

Balaji Enzyme and Chemical Pvt Ltd

Introduction

Sugarcane syrup, a liquid amber crafted from the juice of sugarcane, is a timeless indulgence in culinary creations. To preserve the richness of this natural sweetener and extend its shelf life, various methods are employed, combining tradition with modern preservation techniques.

1. Harvesting and Extraction:

Sugarcane is typically harvested when it reaches optimal maturity. The cane is then crushed to extract its juice, the primary ingredient for syrup production. The timing of harvesting is crucial, as mature sugarcane yields juice with a higher sugar content, contributing to the syrup's sweetness.

2. Heat Treatment - Boiling & Evaporation:

The most traditional preservation method involves boiling the sugarcane juice. This process achieves multiple objectives, including the destruction of microorganisms, enzymes, and the concentration of sugars.

Boiling is often followed by evaporation, reducing the moisture content and creating the thick, viscous consistency characteristic of sugarcane syrup.

3. Filtration and Clarification:

After boiling, the syrup undergoes filtration to remove impurities and solid particles.

Various filtration methods, such as using mesh screens or fine cloth, help achieve a clear and smooth syrup.

4. Packaging Techniques:

Airtight containers are pivotal in preventing the entry of air and moisture, which could compromise the quality of the syrup.

Dark-colored bottles or containers shield the syrup from light, preserving its color and preventing flavor deterioration caused by light exposure.

5. Pasteurization:

Modern preservation techniques often involve pasteurization, a process that involves heating the syrup to a specific temperature to eliminate harmful microorganisms.

Pasteurization extends the shelf life of sugarcane syrup while maintaining its natural characteristics.

6. Adding Preservatives:

While some purists prefer an all-natural approach, commercially produced sugarcane syrups may include food-grade preservatives to enhance shelf stability.

Common preservatives include citric acid or ascorbic acid, which also contribute to flavor preservation.

7. Quality Control Measures:

Regular testing for pH levels, sugar content, and microbial presence is crucial in maintaining quality.

Quality control measures may include sensory evaluations to ensure the syrup meets flavor and consistency standards.

8. Cold Storage: Storing sugarcane syrup in a cool environment, such as refrigeration, can slow down microbial growth and oxidation processes, further extending its shelf life.

Culinary Uses:

1. Sweetening Agent:

Sugarcane syrup serves as an excellent natural sweetener, adding a distinct flavor to various dishes and beverages.

It can be used as a substitute for traditional sweeteners like honey or maple syrup.

2. Baking Delights:

In baking, sugarcane syrup imparts a unique taste to cookies, cakes, and pastries.

Its thick consistency enhances the texture and moisture of baked goods.

3. Culinary Glazes and Sauces:

Chefs often utilize sugarcane syrup to create glazes for meats or as a base for sauces, adding depth to savory dishes.

Its ability to caramelize makes it a perfect ingredient for barbecue sauces and marinades.

Conclusion:

Sugarcane syrup, with its rich flavor and versatility, stands as a testament to the potential of natural sweeteners. Preserving this liquid gold through careful techniques ensures that its goodness can be enjoyed across various culinary delights and health-conscious applications. As we explore innovative ways to incorporate sugarcane syrup into our daily lives, its significance in both culinary and medicinal realms remains undeniable.



Medicinal and Health Benefits:

1. Energy Booster:

The natural sugars present in sugarcane syrup provide a quick energy boost, making it a popular choice for athletes or those needing a rapid source of energy.

2. Antioxidant Properties:

Sugarcane syrup contains antioxidants that help combat free radicals in the body, potentially contributing to overall health.

3. Traditional Remedies:

In some cultures, sugarcane syrup is used in traditional medicine to alleviate sore throats or as a cough remedy.



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