APPEARANCE

TEXTURE

SMELL

TASTE



RYE BREAD *in words*

A GLOSSARY OF SENSORY TERMS
TO DESCRIBE RYE BREAD

AKADEMIE Deutsches Bäckerhandwerk Weinheim

LESAFFRE

breadsinwords.bakingwithlesaffre.com

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The idea behind the project

Rye bread holds a rich and long-standing tradition in the OCEA region of Eastern Europe, **where it has been a staple in households and a symbol of cultural heritage for generations. Its distinctive flavours, textures, and versatility make it an iconic product,** yet describing and evaluating rye bread in a precise and consistent manner remains a challenge. The diversity of sensory perceptions among consumers and professionals further highlights the need for a shared language.

To address this, we are developing a sensory booklet dedicated to rye bread **in collaboration with the Akademie Weinheim, renowned for its extensive expertise in bread sensory analysis. This partnership ensures the highest level of knowledge in crafting a unified vocabulary and repeatable assessment framework.** The booklet will act as a bridge between experts and consumers, capturing the full sensory experience of rye bread—its aroma, taste, texture, and appearance.

For the purpose of this booklet, we define rye bread as any bread containing at least 40 % rye flour of the total weight of flour in the dough. However, it is important to note that the specific regulations and classifications regarding the required rye content in rye bread vary significantly from country to country, reflecting the diverse baking traditions and cultural interpretations across different regions.

About the authors

The German National Bakers' Academy in Weinheim, led by Bernd Kütscher, is Germany's national specialized school and is renowned worldwide. In addition to offering master baker and master confectioner training, it provides globally unique educational programs, such as the Bread Sommelier and Chocolate Sommelier certifications. The academy introduces international bakers to the fundamentals of German bread culture, recognized by UNESCO as part of Germany's intangible cultural heritage. The academy was honored by the European Commission with the «Innovative Vocational Excellence and Training Provider Award,» recognizing it as Europe's most innovative vocational training institution.

Bernd Kütscher is a master baker, business economist, and bread sommelier—a state-recognized educational program he invented in 2015, which now boasts several hundred graduates from around the world. He leads the National Bakers' Academy in Weinheim as well as the German Bread Institute in Berlin. His achievements include the creation of the «Weinheimer Brotsprache» (Weinheim Bread Language) and the publication of several specialized books on bread. The media sometimes refer to Bernd Kütscher as the «Bread Pope.» He also coaches the German National Bakers' Team and serves as the jury president for the World Championships of the UIBC, the International Union of Bakers and Confectioners.

Lesaffre sets the global standard for yeast and other fermentation products. The company designs, manufactures and markets solutions that promote baking, nutrition, health and the protection of living organisms. In close collaboration with its clients, Lesaffre confidently innovates, in order to better nourrish and protect the planet.

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Editorial



Bernd Kütscher

Former Director of the National Bakers' Academy in Weinheim

"As a child, my room was directly above the large, brick-built, and always warm oven of my parents' bakery. During the day, I spent my time in the bakery, and instead of playing with modeling clay, I played with dough. Unlike the pliable wheat dough, which is easy to shape, rye dough is very sticky. It was impossible to shape proper animal figures from it – something I didn't like at all! However, rye bread was always wonderful, and I still appreciate it to this day."

The History of Rye Bread:

After wheat, rye is the most important grain for bread production, valued for its robust cultivation, especially in cooler regions with nutrient-poor soils. Rye has a long tradition in Northern- Central and Eastern Europe and was once appreciated as an affordable «poor man's bread» due to its filling and nutrient-rich properties. In warmer regions, however, rye was less commonly grown, which is why rye bread remains a niche product in those areas. The mixed bread made from rye and wheat has long been considered the quintessential German bread. Today, rye bread is prized as a premium traditional product with nutritional benefits, thanks to its distinctive sourness and intense aroma.

The Future of Rye Bread:

Through milder sourdough processes, gentle fermentation, and the addition of seeds or ancient grains, rye bread has become more appealing in both taste and appearance. In the future, premium breads – locally produced and sustainable – are likely to gain importance again. These include rye wholemeal breads, which are particularly recommended from a nutritional science perspective.

Despite the long tradition of rye bread, there are also innovative new approaches. One example is bread made from «Lichtkornroggen,» a relatively new rye variety developed through natural crossbreeding in the 1980s. Another is the rediscovery of old, once-forgotten heritage grains, such as «Champagnerroggen,» which originally comes from France. Additionally, innovative recipes with modified nutritional profiles, such as low-carbohydrate breads with high fiber and seed content, are currently trending.

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Unique Characteristics of Rye Bread:

Rye bread contains higher levels of fiber and minerals, making it particularly valuable from a nutritional standpoint. Sensorially, rye bread is defined as sourdough, which is essential for the baking properties of rye dough due to the high enzymatic activity of rye flour.

The heterofermentative lactic acid bacteria in the sourdough, which produce both lactic acid and acetic acid, give rye bread its characteristic, slightly sour note, fermentation aromas, and moist, dense crumb. Additionally, rye breads require longer baking times than breads made purely from wheat flour, resulting in a thicker crust. This crust not only prolongs freshness but also provides robust nutty and roasted flavours, making the bread especially flavourful. Furthermore, the acetic acid formed in the sourdough acts as a natural preservative against mold.

The world of rye breads is vast, from Rheinisches Schwarzbrot to Frankenlaib, Berliner Landbrot to Pumpernickel, and Friesenbrot to Südtiroler Schüttelbrot. The variety spans from compact, dark, and sour to milder, airier variations. The diversity in shapes (e.g., loaves, tin loaves, baguettes) and additions to rye dough (e.g., seeds, beet syrup, malt) is equally impressive.

The Weinheim Bread Language:

Experts at the Weinheim Academy have also delved into the sensory description of rye bread. The «Weinheimer Brotsprache» (Weinheim Bread Language) provides a scientifically based, comprehensive framework for experts to assess and describe bread -including rye bread- with accuracy and consistency. It encompasses 10 steps and offers users a fascinating sensory journey. The Weinheim Bread Language is available for free download in multiple languages at akademie-weinheim.de.

About Sensory Analysis

Industrial, in-store, and artisan bakers must use sensory analysis as a key assessment technique in order to comprehend the consumer's perspective and experience when consuming a product.

- ***Marketing***

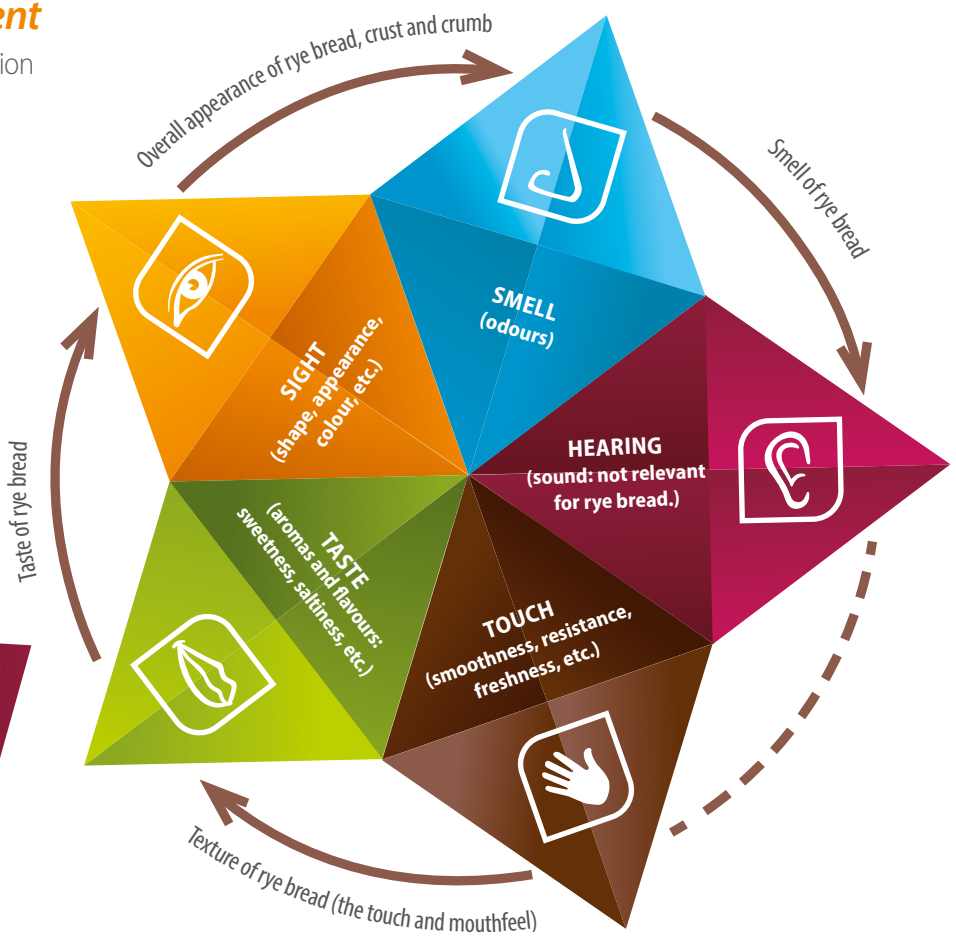
  Creation and approval of product concepts, and competition research.

- ***Research & Development***

  Formulation and process optimization

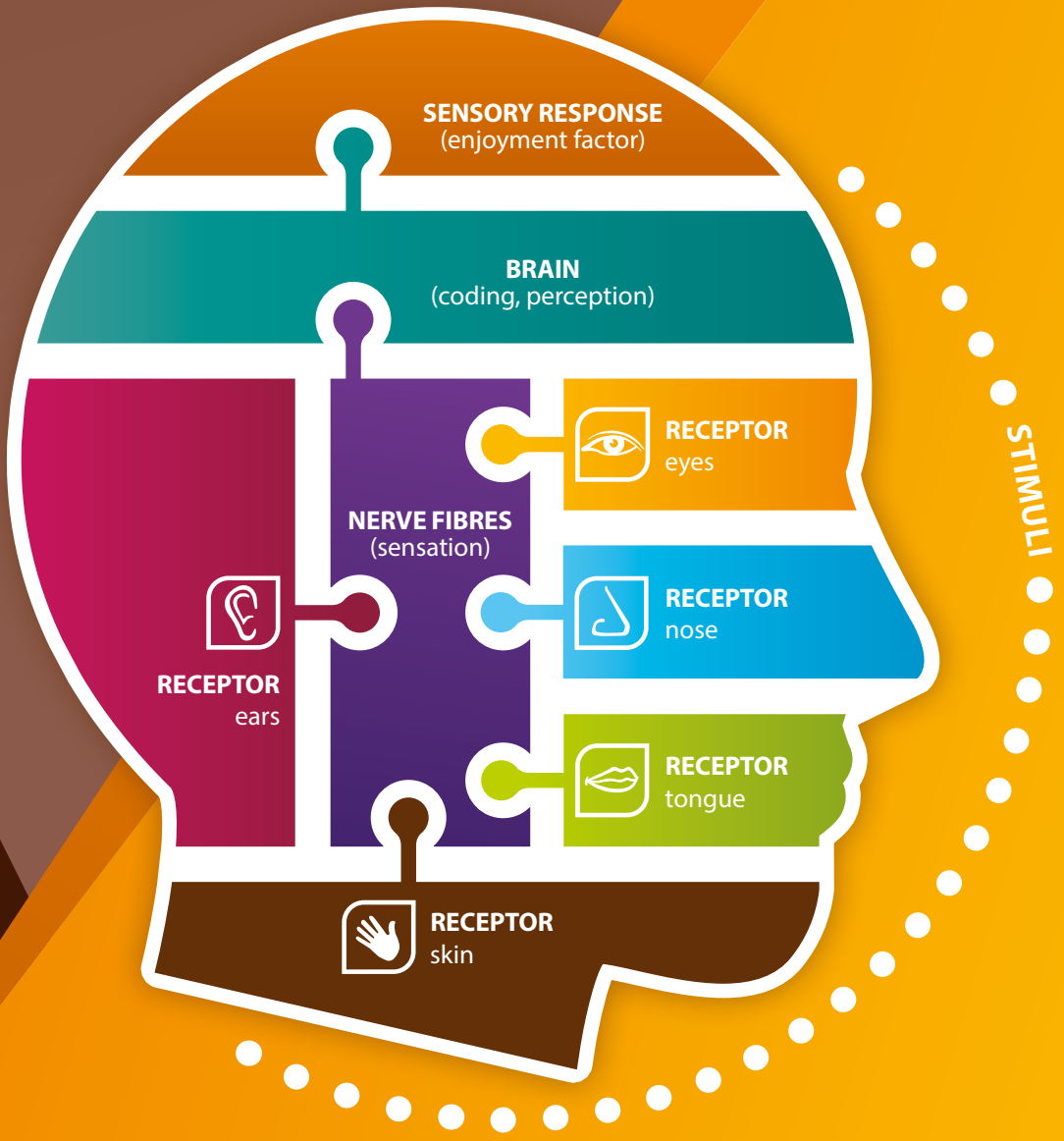
- ***Quality***

  Monitoring of raw materials and finished goods



In this methodology, a human panel spotlights and characterizes the organoleptic attributes (such as a product's appearance, smell, texture, and taste).

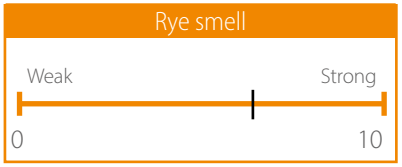
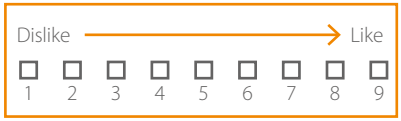
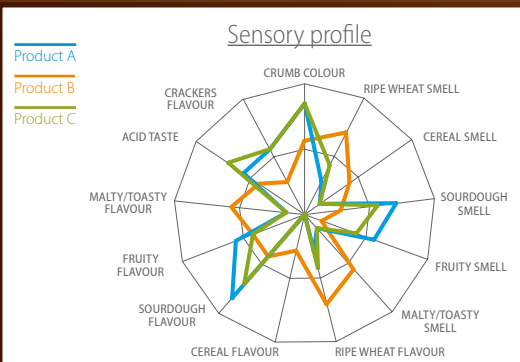
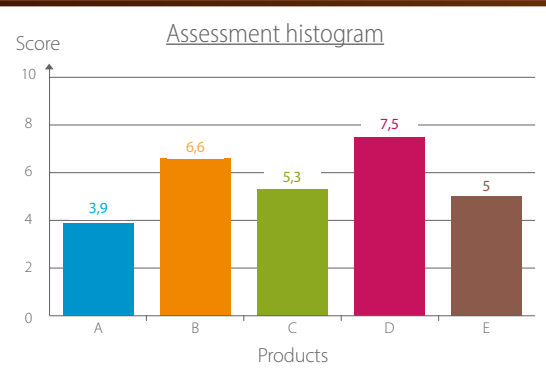
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The retronasal pathway, so termed by experts, is the journey taken by the flavours released in the mouth while eating rye bread to develop and reach the nose. These aromas should not be confused with those that one experiences when smelling a product (scent and smell). Flavours are the collective term for the simultaneous perception of tastes, odours, and mouth-feel sensations that occur during tasting.

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Two sensory approaches

	Expert vocabulary	Consumer vocabulary
Test	An objective analysis of various sensory criteria or attributes undertaken by a measuring instrument	Consumers' assessment of a product's acceptability
Panel	Expert - 10 to 15 people having undergone 20 hours of specialist training and continued monitoring using regular performance tests	No training - 60 people minimum
Product assessment and product presentation	Scoring scale with identified markers (attribute with precise definition) 	• Allocation of score on assessment scale • Reasons for preferences (enjoyment factor: whether "liked/disliked") 
Typical results		
Typical conclusion	***Product B is characterized by stronger ripe wheat & malty/toasty smells and tastes than products A & C.*** *N.B.: possibility of correlation with TAXT+, pH meter readings, etc.*	***The preferred product is the ...***

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General good tasting practices



Tasters are required to:

- Report any physical issues (cold, dental care, etc.).
- Avoid smoking, wearing perfume, eating/drinking any strong-tasting products (coffee, spicy food, etc.) for at least one hour prior to tasting.
- Avoid talking to other panelists when assessing the products and remain silent during the panel.
- Evaluate equivalent amounts for each product.
- Before tasting each product, rinse your mouth with water.
- Spend as much time as is thought necessary for each test.

The products should be:

- Presented anonymously (coded samples).
- Presented under the same conditions (temperature, amounts and degree of baking).
- When comparing breads, they should be at the same stage of their shelf life.
- The fresh product should be assessed within 30 min after cooling.
- Slices presented to tasters should be taken from the middle of the bread. The thickness must be consistent across all samples assessed.

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APPEARANCE

The first factor to be assessed when tasting bread is its appearance.
The assessment is made in 3 stages: the appearance of the whole loaf, then that of the crust, ending with the examination of the crumb of the sliced loaf.



Prof. Michael KLEINERT

Master Baker and Head of the Institute of Food and Beverage Innovation at the Zurich University of Applied Sciences



Shared experiences

"The assessment of bread quality should always be conducted within a regional context and with consideration of consumer expectations. One of the most critical factors for me is the degree of browning, which can range from light to golden brown to dark with a hint of bitterness.

Each variation can be rated as «good to excellent» depending on individual preferences. Furthermore, the shape of the bread slices plays a significant role, as it often determines the bread's intended use and, ultimately, its success.

A prime example is toast as well as rye bread baked in tins, whose popularity is closely tied to their characteristic square slice shape.

My personal connection to rye bread runs deep. A golden-brown, oval rye-mixed bread loaf weighing 1.5 kilograms was a staple of my childhood in Northern Germany. In my parents' bakery, this bread was a bestseller and has shaped my perception of quality and craftsmanship to this day. Since my apprenticeship in the family bakery, it has remained, for me, the epitome of a well-made bread.

Rye bread has its roots predominantly in Central and Northern Europe, where it has traditionally played a vital role in the diet. Until the 1980s, the use of sourdough was essential to ensure the baking capability of rye flour. This often resulted in a pronounced sour intensity, which remains a defining characteristic of an «authentic» rye bread to this day. However, visually and in flavour, both mild and intense sour profiles can meet consumer expectations, depending on their preferences.

The concept of what constitutes good bread is continuously evolving, shaped by changing values and demands. While appearance initially captures consumers' attention, it is taste and enjoyment that ultimately drive repeat purchases. At the same time, aspects such as sustainability and regenerative production are becoming increasingly important for younger generations. There is a growing expectation that grain, flour, and the finished bread are produced within a holistically sustainable framework.

Therefore, the bread of the future must not only excel in flavour but also be reasonably priced, sustainable, and future-proof."

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Appearance / **Appearance of the whole loaf**

Expert Vocabulary



• Regularity of loaf shape

Asymmetrical ⟷ *Symmetrical*





• Uniformity of cross section

Asymmetrical ⟷ *Symmetrical*





• Development

Under-developed ⟷ *Over-developed*



Consumer Vocabulary

• Oval, industrial looking

• Traditionnal, industrial looking, oval

• Flat, thin, industrial looking

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Appearance / **Appearance of crust**

Expert Vocabulary	Consumer Vocabulary
• Crust colour 	• Dark brown, coffee, dark
• Intensity of crust colour 	• Dark
 • Thickness of crust  	• Rustic, craft, traditionnal, industrial looking
 • Shiny appearance of the crust  	• Shiny, glossy, smooth, industrial looking
 • Evenness of crust colour  	• Even, smooth, industrial looking

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Appearance / **Appearance of crumb**

Expert Vocabulary

- **Crumb colour**



- **Intensity of crumb colour**

Pale — *Dark*



- **Evenness of crumb colour**

Uneven — *Even*

- **Evenness in size of crumb cells**



Uneven — *Even*



- **Average size of crumb cells**

Small — *Large*

- **Depth of crumb cells**



Shallow — *Deep*

Position a 2 cm thick slice in front of a light source. Greater light transmission indicates deeper and more open crumb cells.



Consumer Vocabulary

- **Dark brown, caramel, burnt**
- **Dark**
- **Even, industrial looking, smooth, pale**
- **Even, industrial looking, good**
- **Holes, voluminous, well risen, uneven, large, open**
- **Open, voluminous, holes, deep holes**

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Appeareance

Illustration

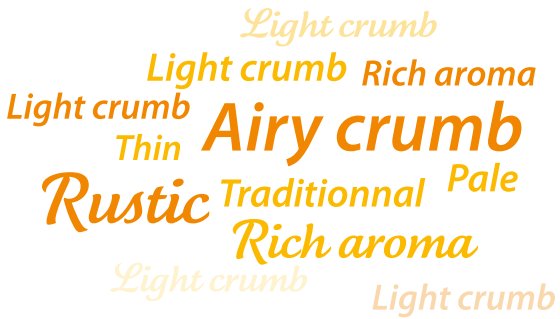
Naš Pečen

Naš Pečen is a traditional Czech wheat-rye bread with a light and airy crumb, a rich aroma, and a characteristic caraway flavour.



Formula	Dough	
Wheat flour (all purpose)	1920 g	60.00 %
Rye flour (all purpose)	1280 g	40.00 %
Rye sourdough (60 SG)	416 g	13.00 %
Yeast	70,4 g	2.20 %
Salt	70,4 g	2.20 %
Improver	32 g	1.00 %
Cumin	32 g	1.00 %
Water	2144 g	67.00 %
Total	**5965 g**	

Process	
Mixer type	Spiral mixer
Mixing time	4 min. slow speed + 4 min. fast speed
Dough temperature	28 °C
Bulk fermentation	15 min.
Dividing	945 g
Shaping	Oval
Final proofing	40 min. at 35 °C and 75 % RH
Baking temperature	240 °C - 210 °C min
Baking time	45 min.
Makes 6 breads with 850 g	



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SMELL

The smell of freshly baked goods have a tremendous magnet to the consumer! When the scent initially tempts the consumer's nose, the process of tasting begins, and it continues in the mouth.



Halyna BOHDAN

Main specialist of the Department of Baking Technologies and Biotransformation of Grain Products

Institute of Food Resources
National Academy of Agrarian Sciences, Kyiv, Ukraine.

Shared experiences

"The unique aroma of rye bread sets it apart from all other types of bread. That distinctive smell of malt and rye, with hints of spice and fruit, is the first thing you notice. No matter what type of bread it is – the aroma is unmistakable. It evokes the image of a warm, oven-fresh loaf with a crispy crust, one that instantly makes your mouth water.

For me, the aroma is one of the most important things when evaluating bread. It needs to be intense, vibrant, and really showcase the ingredients it's made from. Sourdough rye bread, in particular, is something special. Its flavour brings out the best of rye-malty notes, a slight lactic sourness that reminds you of fruits or apples, but never too sharp or acetic.
To get this right, the process has to have enough time for the brewing and fermenting stages. Rye bread isn't just about the aroma; the eating experience is just as unique. You can feel its porous structure, elasticity, and juiciness, along with a gentle acidity. That's all thanks to fermentation, which produces lactic acid. This doesn't just give rye bread its signature flavour and texture, but it also helps keep it fresh for longer.

One trend I've noticed is a return to traditional methods. With sourdough, for example, many bakers are going back to spontaneous fermentation, the way it was done in the old days. This often involves using flowers, fruits, or plants that are naturally rich in microorganisms. At the same time, there's a real focus on avoiding additives and sticking to natural or even organic ingredients. The goal here is to really highlight the natural aromas of the raw materials and bring out the richness of sourdough and brews.

There's definitely a generational shift in bread preferences, too. Younger people often prefer fluffy wheat bread with sweet additives and improvers. But the healthy eating trend and the rise of artisan bakeries have sparked more interest in rye bread, especially when it's made with innovative flavours or new ingredients. That said, classic rye breads, like Ukrainian rye, still aren't very popular with younger consumers. The older generation, on the other hand, tends to stick to their traditional favorites and isn't as keen on trying new things.

What I do find disappointing is that so many rye breads today have an 'empty' or bland flavour. This is likely because businesses prioritize speed and efficiency over quality. But when you take the time to follow traditional methods properly, the result is a rye bread with a richness and aroma that's truly unmatched."

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Smell

To illustrate each expert attribute, a specific recipe can be used. All flavour sample breads should contain 40 – 60 % rye.

Expert Vocabulary		Consumer Vocabulary
• Acetic, vinegar smell Weak — Intense	**RECIPE** ✓ 6 g rye bread crumb ✓ 2 g cider vinegar	• Vinegar, acetic, sourdough, sour, fermented
• Alcohol smell Weak — Intense	**RECIPE** ✓ rye bread crumb ✓ Sprayed with 0,5 % ethanol (70 %)	• Alcohol, fermented
• Apricot smell Weak — Intense	**RECIPE** ✓ 5 g rye bread crumb ✓ 2 g apricot puree	• Fruity, honey, sweet, savoury, malty
• Caramel smell Weak — Intense	**RECIPE** ✓ 6 g rye bread crumb ✓ 2 g caramel syrup ✓ 6 g water	• Caramel, buttery, coffee, grilled, burnt, nutty, sweet
• Cereal, bran smell Weak — Intense	**RECIPE** ✓ 4 g rye bread crumb ✓ 4 g wholewheat ✓ 3 g flour	• Cereals, grains, wholemeal
• Chocolate smell Weak — Intense	**RECIPE** ✓ 4 g rye bread crumb ✓ 0,5 g cocoa powder ✓ 1 g water	• Cocoa, mocha, malty, roasted, burnt, rye, bitter, sweet
• Cinnamon smell Weak — Intense	**RECIPE** ✓ 5 g rye bread crumb ✓ 0,5 g ground, toasted cinnamon	• Cinnamon, clove, caramel, sweet
• Coriander, cumin smell Weak — Intense	**RECIPE** ✓ 4 g rye bread crumb ✓ 0,5 g ground spices	• Fennel, anise, carraway, herbs
• Cranberries smell Weak — Intense	**RECIPE** ✓ 5 g rye bread crumb ✓ 2 g cranberry puree	• Berries, fruity, stone fruit, fermented, sweet, sweet/sour

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Expert Vocabulary

Consumer Vocabulary

Expert Vocabulary	RECIPE	Consumer Vocabulary
• Fatty smell Weak ····▶ Intense	✓ 5 g rye bread crumb ✓ 2 g melted margarine	• Fatty, buttery, wheaty, doughy, sweet
• Honey smell Weak ····▶ Intense	✓ 4 g rye bread crumb ✓ 1 g honey	• Honey, fermented, wheaty, sweet
• Lactic smell Weak ····▶ Intense	✓ 3 g rye bread crumb ✓ 5 g plain yoghurt	• Buttery, fatty, greacy, caramel, sour
• Nutty smell Weak ····▶ Intense	✓ 5 g rye bread crumb ✓ 2,5 g nutpowder ✓ 3 g water	• Nutty, walnut, cereal
• Prune smell Weak ····▶ Intense	✓ 5 g rye bread crumb ✓ 2 g prune juice	• Fruity, malty, sweet
• Roasted, malty smell Weak ····▶ Intense	✓ 4 g rye bread crumb ✓ 0,5 g roasted and smoky malt ✓ 1 g water	• Roasted, smoky, malty, burnt, coffee, mocha, rye
• Rye smell Weak ····▶ Intense	✓ 7 g rye bread (90 % rye flour)	• Rye, mushroom
• Sourdough smell Weak ····▶ Intense	✓ 5 g rye bread crumb ✓ 3 g liquid sourdough ✓ 7 g water	• Sourdough, vinegar, sour, fermented, floury, wheaty, yeasty
• Wheat smell Weak ····▶ Intense	✓ 7 g wheat flour ✓ 5 g water	• Wheat, flour, doughy, plain, bland, buttery, fermented, sweet, salty

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Smell

Illustration



Rye smell
Malty note
Coriander smell
Spicy note
Spicy note
Malty note
Roasted
Aromatic
Spicy note
Rye smell
Coriander

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Zavarnyi

Zavarnyi bread is a traditional Ukrainian rye bread with a malty note, a spicy coriander aroma, and a moist, dark crumb.

Formula	Sourdough	Zavarka	Sponge	Dough	
Rye flour (all purpose)	900 g	500 g	1300 g	1000 g	74.00 %
Wheat flour (all purpose)				1000 g	20.00 %
Rye malted flour		300 g			6.00 %
Sourdough starter	9 g				0.18 %
Salt				90 g	1.80 %
Sugar				300 g	6.00 %
Treacle syrup				200 g	4.00 %
Coriander				15 g	0.30 %
Water	1800 g	1500 g*		1050 g	87.00 %
Sourdough			2709 g		54.00 %
Sponge				6324 g	126.50 %
Dough			2315 g		46.00 %
Total	**2709 g**	**2300 g**	**6324 g**	**9979 g**	

*The water is added at 80 – 90 °C after mixing the Zavarka temperature should be +70 °C

Process	Sourdough	Zavarka	Sponge	Dough
Mixer type	Spiral mixer	Spiral mixer	Spiral mixer	Spiral mixer
Mixing time	5 min. slow speed + 4 min. fast speed	5 min. slow speed + 4 min. fast speed	5 min. slow speed + 4 min. fast speed	5 min. slow speed + 4 min. fast speed
Dough temperature	28 °C	+70 °C	29 °C	29 °C
Bulk fermentation	24 h at 28° C and 75 % RH	3 - 3,5 h at 23 °C and 50 % RH	3 - 3,5 h at 29 °C and 75 % RH	50 - 60 min at 23 °C and 50 % RH
Final acidity (SG)	9 - 11		8 - 9	7 - 8
Dividing				550 g
Shaping				Tin, topped with 0,3 % coriander
Final proofing		Rest until it reaches 30 °C		50 - 60 min at 35 °C with 75 % RH
Baking temperature				240 – 200 °C
Baking time				30 – 35 min.
Makes 18 breads with 500 g				



TEXTURE

The texture of rye bread plays a key role in the sensory experience.
It is first felt by touch, then perceived in the mouth.
Evaluating texture means considering the whole loaf: Is it elastic, moist, firm, or dry?



Erwin HEFTBERGER

Teacher and administrator at the HTL for food technology and master school for millers, bakers and confectioners in Wels.



Shared experiences

"The properties of rye flour have a significant impact on the texture of rye and mixed rye breads. Since rye starch begins to gelatinize at low temperatures, it is easily broken down by amylases. Excessive breakdown of starch results in a moist, sticky crumb and may cause the crust to tear.

The addition of sourdough helps control this breakdown by lowering the pH and inhibiting enzyme activity. In addition to lactic acid in the sourdough, fermentation produces aromatic precursors that improve both the flavour and the texture of the crumb, ensuring a moist bread texture.

In Austria, there is a wide variety of rye and mixed rye breads, distinguished by different spices, flour types, and pre-ferments. However, due to climatic changes and the use of rye varieties low in enzymatic activity, the quality of rye flour has declined, resulting in drier. To counteract this, various pre-ferments such as bread mash, scalds, and aromatic pieces are used. These not only improve the texture but also add a malty-sweet note, which is particularly beneficial for pure rye breads. The use of old rye varieties has further expanded the diversity of breads. Scalds create a moist, sticky crumb, which is particularly appreciated by younger consumers. Additionally, the use of part-baked methods allows for efficient production and storage of bread in cool, humid environments without quality loss.

I particularly enjoy rye bread with aromatic pieces, as they add a malty sweetness to the bread and balance out the sour notes of the sourdough. These breads have a moist, juicy crumb that doesn't clump when chewing, making the texture especially pleasant. A well-balanced acidity completes the overall experience.

Sensory evaluation is crucial for me to determine whether the desired result has been achieved. A clear structure in assessing volume, appearance, crust, texture, and flavour helps to obtain objective results. It is especially helpful to describe both the best and less favorable outcomes to make a well-founded and clear assessment.

Rye breads are found worldwide in a variety of flavours, aromas, and textures. This diversity demonstrates that there is no singular «rye bread taste,» as flavour is a matter of habit, which changes over time. I believe the «rye bread taste» has evolved in many different directions, leading to an overwhelming variety of breads. For me, bread is an art form and an expression of culture, attitude, and values."

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Texture / **Touching the crust**

Expert Vocabulary

- **Resistance to pressure**

Assess the behaviour of the bread when the surface is compressed (lateral/vertical pressure).

Hard ⟷ *Soft, tender*



Consumer Vocabulary

- **Soft, springy, moist, firm, dense, elastic**

Texture / **Touching the crumb**

Expert Vocabulary

- **Resistance to pressure**

Gently press the crumb with your fingers and assess how firmly it resists compression.

Hard ⟷ *Soft*



- **Crumb moisture**

Assess crumb moisture by gently pressing the slice on both sides between thumb, index and middle finger. Moist crumbs will feel slightly cool and supple, while dry crumbs may feel brittle or crumbly.

Dry ⟷ *Moist*



Consumer Vocabulary

- **Soft, springy, moist, firm, dense, elastic**

- **Moist, cold, fresh**

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Texture / **Touching the crumb**

Expert Vocabulary

- **Dry halo**

The outer zone of the crumb, directly in contact with the crust, is evaluated with one finger for signs of increased dryness compared to the inner crumb.

Large ⟶ *no-, or very thin halo*



- **Elastic texture**

After applying firm pressure to the crumb with one finger, the crumb's ability to recover its original shape is observed.

Very elastic, the crumb immediatly springs back ⟶ *Plastic deformation, the finger mark remains visible*



- **Spreadability**

Gently pass the finger on the crumb a few times to imitate the action of a knife. Assess whether the crumb maintains its structure or if it tends to tear or crumble during the movement.

Not spreadable ⟶ *Spreadable*



Consumer Vocabulary

- **Fresh, soft, moist**
- **Elastic, soft, flexible, fluffy, springy**
- **Smooth, fluffy, spongy, fresh, flexible**

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Texture / **Eating the crumb**

Expert Vocabulary

Consumer Vocabulary

• Melt-in-the-mouth/absorption

Place the crumb on your tongue, press it against your palate and observe how quickly and effortlessly it dissolves without excessive chewing.

Hard to dissolve, lots of saliva required — *Quickly dissolving with little saliva*

• Fluffy, desintegrates quickly

• Crumb moisture

Place a piece of crumb in the mouth and assess whether it feels juicy and soft or dry and crumbly.

Dry mouthfell — *Moist/ fresh mouthfeel*

• Moist, cold, fresh

• Bite length

Chew a standard bite-sized piece of crumb and observe how long it takes to swallow the crumb.

Long bite — *short bite*

• Quick to chew, desintegrates quickly, chewy, fresh, elastic

• Sticky texture

Place a piece of crumb in your mouth and chew 10 times, evaluate whether it adheres to the palate or teeth during chewing.

Non- sticky — *Sticky*

• Sticky, quick to chew, chewy, soft, fresh

• Dough-like texture

Place a piece of crumb in your mouth and assess whether it feels dense, gummy, sticky, and underbaked, similar to raw dough.

Sandy — *Dough-like*

• Rubbery, compact, moist, dense, sticky, tacky

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Texture

Illustration

Krustenlaib

Traditional Austrian rye bread with a strong sourdough flavour and characterised by its rustic crust.

Formula	Sourdough	Dough	
Rye flour (all purpose)	2550 g	3375 g	79.00 %
Wheat flour (all purpose)		1125 g	15.00 %
Rye whole grain flour		450 g	6.00 %
Sourdough starter	13 g		0.17 %
Salt		165 g	2.20 %
Softness improver		75 g	1.00 %
Yeast		90 g	1.20 %
Oil		100 g	1.30 %
Water	2040 g*	4186 g	83.00 %
Sourdough		4603 g	61.00 %
Total	**4603 g**	**14169 g**	

*30 °C

Process	Sourdough	Dough
Mixer type	Spiral mixer	Spiral mixer
Mixing time	4 min. slow speed	8 min. slow speed
Dough temperature		29-32 °C
Bulk fermentation	16 - 20 h, at 28 - 30 °C	30 - 40 min. at 23 °C
Dividing		1150 g
Shaping		Round
Final proofing		20 - 40 min. at 30 °C and 75 % RH
Baking temperature		Starting at 250 °C falling to 200 °C, with fog
Baking time		60 min.
Makes 12 Breads with 1000 g		





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TASTE

A purchase, especially a repeat purchase,
is heavily influenced by the bread's taste.





PhD Eng. **Krystyna JAROSZ**

An experienced educator and advocate for traditional bakery techniques, she shares her expertise in rye bread and baking through training, publications, and active industry involvement.

Shared experiences

"Rye bread has long been a staple in many countries, especially in Central and Eastern Europe, and is increasingly popular in modern diets due to its distinctive taste and aroma. The key factor in its unique flavour is the acid fermentation process, which can take several hours.

To make the bread more appealing, additional ingredients can be used to enhance its taste and aroma. Rye bread's crumb structure is ideal for incorporating ingredients like seeds, dried fruits, or spices, as its moist, adhesive dough helps evenly distribute these inclusions while maintaining a consistent, porous crumb. In contrast, wheat flour's strong gluten network limits the ability to add mix-ins.

The choice of inclusions often depends on consumer preferences or regional traditions. For example, I've created an excellent rye bread using 100 % type 720 rye flour with dried cranberries and roasted garlic flakes. These contrasting flavours pair well with both savory toppings like ham and cheese or sweet ones like honey and jam. Such innovative combinations, alongside traditional recipes, provide opportunities to expand rye bread's appeal.

Rye bread, with its acid fermentation process, is also easier to digest than wheat bread, provides greater satiety and naturally exhibit slow staling. Current dietary trends favor dark bread, and rye products. Production technology results in a visually appealing crumb colour, ranging from light to dark brown, without the need for artificial colorants or additives, which are often used in wheat bread and have altering effects on its taste and flavour.

Rye bread is often linked to wholegrain bread, but a diet exclusively based on wholegrain products can negatively affect one's digestion, leading some consumers to avoid rye bread. Rye bread made from type 720 rye flour, however, offers a viable alternative. It is suitable for daily consumption and provides significant health benefits while avoiding the digestive drawbacks of wholegrain bread."

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Flavour

To illustrate each expert attribute, a specific recipe can be used. All flavour sample breads should contain 40 – 60 % rye.

Expert Vocabulary		Consumer Vocabulary
• Acetic, vinegar flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with strong acetic sourdough	• Vinegar, acetic, sourdough, sour, fermented
• Alcohol flavour Weak ····▶ Intense	**RECIPE** ✓ Spray the crumb with ethanol	• Alcohol, fermented
• Apricot flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with fruit juice or puree	• Fruity, honey, sweet, savoury, malty
• Caramel flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with caramel syrup	• Caramel, buttery, coffee, grilled, burnt, nutty, sweet
• Cereal, bran flavour Weak ····▶ Intense	**RECIPE** ✓ Bread with 40 % wholemeal flour	• Cereals, grains, wholemeal
• Chocolate flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with cocoa and a little sugar bread crumb	• Cocoa, mocha, malty, roasted, burnt, rye, bitter, sweet
• Cinnamon flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with cinnamon	• Cinnamon, clove, caramel, sweet
• Coriander, cumin flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with bread spices	• Fennel, anise, carraway, herbs
• Cranberries flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with fruit juice or puree	• Berries, fruity, stone fruit, fermented, sweet, sweet/ sour

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Expert Vocabulary		Consumer Vocabulary
• Fatty flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with vegetable oil	• Fatty, buttery, wheaty, doughy, sweet
• Honey flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with a strong, aromatic baking honey	• Honey, fermented, wheaty, sweet
• Lactic flavour Weak ····▶ Intense	**RECIPE** ✓ Bread with whole milk powder	• Buttery, fatty, greacy, caramel, sour
• Nutty flavour Weak ····▶ Intense	**RECIPE** ✓ Bread with lightly toasted nuts	• Nutty, walnut, cereal
• Prune flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with fruit juice or puree	• Fruity, malty, sweet
• Roasted, malty flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with smoky malt	• Roasted, smoky, malty, burnt, coffee, mocha, rye
• Rye flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with 100 % rye flour and acetic sourdough	• Rye, mushroom
• Sourdourgh flavour Weak ····▶ Intense	**RECIPE** ✓ Bread with high quantity of yeast and mild sourdough	• Sourdough, vinegar, sour, fermented, floury, wheaty, yeasty
• Wheat flavour Weak ····▶ Intense	**RECIPE** ✓ Bread made with 100 % wheat flour	• Wheat, flour, doughy, plain, bland, buttery, fermented, sweet, salty

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Taste

Expert Vocabulary

• **Bitter taste** *Slightly/non bitter* ····▶ *Very bitter*	**RECIPE** ✓ *Bread made with cocoa powder*
• **Salty taste** *Slightly/non salty* ····▶ *Very salty*	**RECIPE** ✓ *Bread made with 4 % salt*
• **Sour taste** *Slightly/non sour* ····▶ *Very sour*	**RECIPE** ✓ *Bread made with high amount of acidifier*
• **Sweet taste** *Slightly/non sweet* ····▶ *Very sweet*	**RECIPE** ✓ *Bread made with 7 % sugar*

Consumer Vocabulary

- **Cocoa, bitter**
- **Salty**
- **Sour, vinegar**
- **Sweet, honey**



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Chleb Żytni

Traditional Polish rye bread with a slightly tangy flavour, a rich aroma, and a dense, moist crumb.



Formula	Sourdough	Dough	
Rye flour (all purpose)	1500 g	1500 g	100.00 %
Sourdough starter	7,5 g		0.25 %
Salt		60 g	2.00 %
Improver		15 g	0.50 %
Yeast		75 g	2.50 %
Water	975 g	1425 g	80.00 %
Sourdough		2482,5 g	83.00 %
Total	**2482,5 g**	**5557,5 g**	

Process	Sourdough	Dough
Mixer type	Spiral mixer	Spiral mixer
Mixing time	1 min. slow speed	6 min. slow speed + 3 min. fast speed
Dough temperature	28 °C	30 -33 °C
Bulk fermentation	23 h at 28 °C and 80 % RH	30 min. at 23 °C and 50 % RH
Dividing		500 g
Shaping		Tin
Dusting		Dusting top with rye flour
Final proofing		30 min. at 31 °C and 75 % RH
Baking temperature		210 °C
Baking time		40 min.
Makes 11 Breads with 450 g		

Dense crumb
Moist crumb Earthy aroma
Dense crumb Aromatic
Earthy aroma Dense crumb
Dense crumb

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Glossary

This index contains all the terms used in this leaflet.
Expert terms are organised in alphabetic order.
In the adjacent columns, the equivalent consumer terms are categorised according to whether the sensation is pleasant or unpleasant.

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	Expert vocabulary	• Sensory family	Consumer vocabulary	
			Pleasant	Unpleasant
A	• Acetic, vinegar	• Flavour • Smell	• Sourdough, fermented	• Vinegar, acetic, sour
	• Alcohol	• Flavour • Smell	• Fermented	• Alcohol
	• Apricot	• Flavour • Smell	• Fruity, honey, sweet, malty, savoury	
	• Average size of crumb cells	• Appearence/crumb	• Well risen, large, open	• Holes, voluminous, uneven
B	• Bite length	• Texture/eating the crumb	• Fresh, quick to chew, elastic	• Desintegrate quickly, chewy
	• Bitter taste	• Taste	• Cocoa	• Bitter
C	• Caramel	• Flavour • Smell	• Caramel, buttery, coffee, nutty, sweet	• Grilled, burnt
	• Cereal, bran	• Flavour • Smell	• Cereals, grains, wholemeal	
	• Chocolate	• Flavour • Smell	• Cocoa, mocha, sweet	• Malty, roasted, burnt, rye, bitter
	• Cinnamon	• Flavour • Smell	• Cinnamon, clove, caramel, sweet	
	• Colour of crumb	• Appearence/crumb	• Dark brown, caramel	• Burnt
	• Colour of crust (tint)	• Appearence/crust	• Dark brown, coffee, dark	
	• Coriander, Cumin	• Flavour • Smell	• Fennel, anise, carraway, herbs	
	• Cranberries	• Flavour • Smell	• Berries, fruity, stone fruit, sweet	• Fermented, sweet/sour

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	Expert vocabulary	Sensory family	Consumer vocabulary	
			Pleasant	Unpleasant
D	• Depth of crumb cells	• Appearence/crumb	• Open, voluminous	• Holes, deep holes
	• Development	• Appearence/whole loaf		• Flat, thin, industrial looking
	• Dough-like texture	• Texture/eating the crumb	• Moist	• Rubbery, compact, dense, sticky, tacky
	• Dry halo	• Texture/touching the crumb	• Fresh, soft, moist	
E	• Elastic texture	• Texture/touching the crumb	• Elastic, soft, flexible, fluffy, springy	
	• Evenness in size of crumb cells	• Appearence/crumb	• Even, good	• Industrial looking
	• Evenness of crumb colour	• Appearence/crumb	• Even, smooth	• Industrial looking, pale
	• Evenness of crust colour	• Appearence/crust	• Even, smooth	• Industrial looking
F	• Fatty	• Flavour • Smell	• Sweet, buttery	• Fatty, wheaty, doughy
H	• Honey	• Flavour • Smell	• Honey, sweet	• Fermented, wheaty
I	• Intensity of crumb colour	• Appearence/crumb	• Dark	
	• Intensity of crust colour	• Appearence/crust	• Dark	

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	Expert vocabulary	• Sensory family	Consumer vocabulary	
			Pleasant	Unpleasant
L	• Lactic	• Flavour • Smell	• Buttery, caramel	• Fatty, greacy, sour
M	• Melt-in-the-mouth/ absorption	• Texture/eating the crumb	• Fluffy, desintegrate quickly	
	• Moisture of crumb	• Texture/touching the crumb	• Moist, fresh	• Cold
	• Moisture of crumb	• Texture/eating the crumb	• Moist, fresh	• Cold
N	• Nutty	• Flavour • Smell	• Nutty, walnut	• Cereal
P	• Prune	• Flavour • Smell	• Fruity, sweet	• Malty
R	• Regularity of loaf shape	• Appearence/whole loaf	• Oval	• Industrial looking
	• Resistance to pressure	• Texture/touching the crust	• Soft, springy, moist, elastic	• Firm, dense
	• Resistance to pressure	• Texture/touching the crumb	• Soft, springy, moist, elastic	• Firm, dense
	• Roasted, smoky	• Flavour • Smell	• Roasted, smoky, malty, coffee, mocha, rye	• Burnt
	• Rye	• Flavour • Smell	• Rye	• Rye

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	Expert vocabulary	• Sensory family	Consumer vocabulary	
			Pleasant	Unpleasant
S	• Salty taste	• Taste	• Salty	
	• Shiny appearance of the crust	• Appearence/crust	• Shiny, glossy, smooth	• Industrial looking
	• sour taste	• Taste		• Sour, vinegar
	• Sourdough, Fermented	• Flavour • Smell	• Sourdough, fermented, yeasty	• Vinegar, sour, floury, wheaty
	• Spreadability	• Texture/touching the crumb	• Smooth, fluffy, fresh, flexible	• Spongy
	• Sticky texture	• Texture/eating the crumb	• Quick to chew, quick to chew, soft, fresh	• Sticky, chewy
	• Sweet taste	• Taste	• Sweet, honey	
T	• Thickness of crust	• Appearence/crust	• Rustic, craft, traditionnal	• Industrial looking
U	• Uniformity of cross section	• Appearence/whole loaf	• Traditionnal, oval	• Industrial looking
W	• Wheat	• Flavour • Smell	• Wheat, flour, buttery, fermented, sweet, salty	• Doughy, plain, bland

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A lexicon for bread...

… a panoramic overview of experts and consumers.

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RYE BREAD
in words

A GLOSSARY OF SENSORY TERMS TO DESCRIBE RYE BREAD

Lesaffre, a company renowned for its sensory expertise, has created a glossary of sensory terms customised for the assessment of rye bread. This tool combines the more subjective consumer perspective with the more objective expert point of view.



Already published

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