



SMELL



SOUND



TEXTURE



APPEARANCE



TASTE



“LE CROISSANT” *in words*



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The idea behind the project

Lesaffre now offers, in collaboration with Hubert Chiron, from the AIPF, a booklet devoted to the organoleptic properties of the croissant and, by extension, to other products made with leavened and laminated doughs (Danish pastries, laminated brioches, stuffed croissants).

The technical sophistication of the croissant, and its eventful history (see section “A little history...by Hubert Chiron”), make it a product of extraordinarily rich organoleptic properties.

Leveraging its baking and sensory expertise, Lesaffre and the AIPF wish to share a reference vocabulary alongside assessment protocols, as well as words from the consumer vocabulary, with the sector. **Most of the parameters mentioned in this booklet can be directly transferable to the neighbouring product categories** and, obviously, the frame of reference must be adjusted according to the type of product considered.

About the authors



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 nourish and protect the planet. .

L'**AIPF**, an International Association for French Bread, leads actions to help develop the production of quality French bread production around the world. They find source in particular in the recommendations of Professor R. Calvel. It puts forward and hosts technological studies and promotes exchanges between bakers and professionals in the wheat-flour-bread sector worldwide.



Hubert Chiron has been head of the AIPF since 2008.

This booklet was undertaken with the help and support of **Bridor**.





A little history

by Hubert Chiron

Now an emblematic product in the international bakery sphere, the laminated Parisian croissant is irresistible. Be its elegant shape, its texture, which is like no other, its taste and its melt-in-the-mouth feel...Bakers from two European capitals, Vienna and Paris contributed to its global success. This delicacy is the product of a long tradition and combines several know-hows.

Even if the factors impacting the organoleptic properties of a croissant are complex (raw materials, laminating/baking techniques ...) and are not the subject of this booklet, it is important to remember that the general principle is based on the combination of a conventional honeycomb structure in which dough sheets separate under the effect of the pressure from water vapour trapped between sheets of fat. A feast for the palate, but a puzzle for scientists when it needs to be explained!

The crescent shape, which represents the moon, is one of the oldest symbols of humanity, used for millennia by different civilisations. In the 11th century, the Swiss scientist Max Waehren witnessed a celebration of the lunar cult, a symbol of regeneration; he mentioned a "panem lunatum".

This popular shape was used in high quality recipes and pastry chefs also made multiple variations of half-moon cakes. A long-standing culinary legend credits Viennese bakers as the inventors of the croissant. They were thought to have contributed to the victory of the Austrian army during the siege of the city by the Turkish armies in 1683. In order to thank them, the authorities allowed them to make a small bread symbolising the flag of the defeated attacker. This version of the story is controversial

because the "kipfels" existed well before that date.

Diplomacy has, incidentally, favoured the exchange of bakery know-how... During the 18th century, French bakers introduced white bread across various European royal courts. Similarly, Marie Antoinette, archduchess of Austria, who was to become Queen of France, had an Austrian baker brought in and introduced popular Austrian-style small bun at the court of Versailles in the 1770s. A Parisian baker from rue Dauphine is believed to have specialised in the making of this bun for the elites, but, unfortunately his recipe and the description of the bun were never revealed. However, in France, small rolls called "à café" were being made, and this well-before the name "croissant" came to be used.

In addition to the legitimate quest for taste refinement, the production of luxury bread rolls at a time when the price of ordinary bread was tightly controlled turned out to be an excellent business opportunity! Thus, the installation in 1838 of the first Viennese bakery in rue de Richelieu guaranteed the fortune of its owner, a person named Zang. His team of Viennese bakers used the best flour of the time. Their recipe also contained milk, and they used a liquid preferment. The crust of the roll they produced had a shine which was remarkable for this era. They had such great success that some Parisian bakers from the high-end neighbourhoods, in turn, had Austrian bakers come in in order to take advantage of the craze for these rolls.

The spread of the croissant shape in Paris didn't happen until later, as it does not appear in a list established in 1857, which lists 70 Parisian breads. However, it appears in the book "Wheat and Bread", published in 1863 under the luxury breads category, in two versions: a croissant costing five cent and another costing ten cents.

The World Fair in Paris in 1867 acknowledged the high quality of Hungarian oat flour as well as Austrian yeast, both viewed as exceptional ingredients. In the last quarter of the 19th century, the combination of Austrian milling, yeast and bakery expertise favoured the international

development of the Viennese breadmaking method.

As a result, in Paris, in 1884, Georges Michel talks about bread in the following manner: "Twenty years ago, only two or three bakeries specialised in Viennese breadmaking. Today, this type of manufacturing, which requires careful attention to detail and which is quite costly, has spread across all neighbourhoods. Even in the suburbs, every baker had to have a Viennese worker. Now, Viennese bread is already outdated".

Well, that last part is not so true... Indeed, the production of croissants was to see constant and substantial growth. In 1890, Majac, the author of a handbook on the making of luxury breads, who claimed fifteen years of experience in the field, shared one of the first recipes. He recommends the use of a small amount of butter and offers two options: "mix the fat by mixing if you want the butter to not come through or, if you want laminated croissants, spread the butter on the lengthened dough, then fold the dough on itself".

After having been cooled for a while, the pieces of dough are cut, shaped into balls, rolled into an oval shape and, lastly, rolled up quickly by applying pressure with the palm of the hand and performing a back and forth movement. The croissants were then, like the other baked bread rolls, baked at the bottom of the oven. This Viennese shaping technique, starting with the oval shaping, gives the croissants a very tightly rolled shape, with their characteristic long, curved ends.

The French culinary tradition and the rivalry between bakers and confectioners led to recipe evolutions, whereby the percentage of butter increased substantially. Thus, in 1892, in a similar register, Lacam published a laminated brioche recipe. It was to be the birth of the Parisian croissant, which was twice as rich in fat than its Viennese ancestor, and made from a yeasted laminated dough, undergoing at least three simple

folds. It was then cut into a triangle and rolled up at the hinge, between the end of the 19th century and the beginning of the 20th century.

Nonetheless, a lighter recipe, consisting of spreading the fat and lengthening the dough, rolling it «like a carpet» and then shaping it into a ball and lengthening it into an oval shape and lastly, ending with a Viennese curved style, had a fair number of supporters until the beginning of the 1930s. This was due to the faster handling allowed by this recipe, and it was also less tiring.

In fact, the Parisian method required more equipment: a refrigerated bench and sheeter. Margarine manufacturers offered fat with higher melting points and actively promoted, especially as from the 1950s, the manufacture of croissants and pains au chocolat throughout France.

Other baking nations had no lack of imagination in this field either. The Viennese and Swiss, for example, excelled in the making of filled croissants, and the Russians developed original variants. Those who contributed most significantly to the growth of the original Viennese bread

were, undoubtedly, the Danish bakers, who, not afraid to produce a generous delicacy, added delicious filling to it and gave it various shapes.

This half-moon roll, a symbol of an almost mystical essence where its origins are concerned, and an emblem of the Viennese bakery expertise, has paved the way to a large number of variations. From the modest milk bun quickly rolled-up, and the brioche croissant, to the instantly-recognised laminated Parisian croissant, the concept of the yeasted and laminated dough is extraordinary because of the originality of its texture. When used with a sweet or savoury filling, it helps produce the most spectacular products in international bakery, making it one of the most popular creations to be made in most of the famous baking competitions.

***“ The concept
of the yeasted and
laminated dough
is extraordinary
because of the
originality of its
texture “***

About Sensory Analysis

Sensory analysis is an essential tool for industrialists, in-store bakeries and craft bakeries.

- **Marketing**

Development and validation of product concepts, analysis of competition.

- **Research & Development**

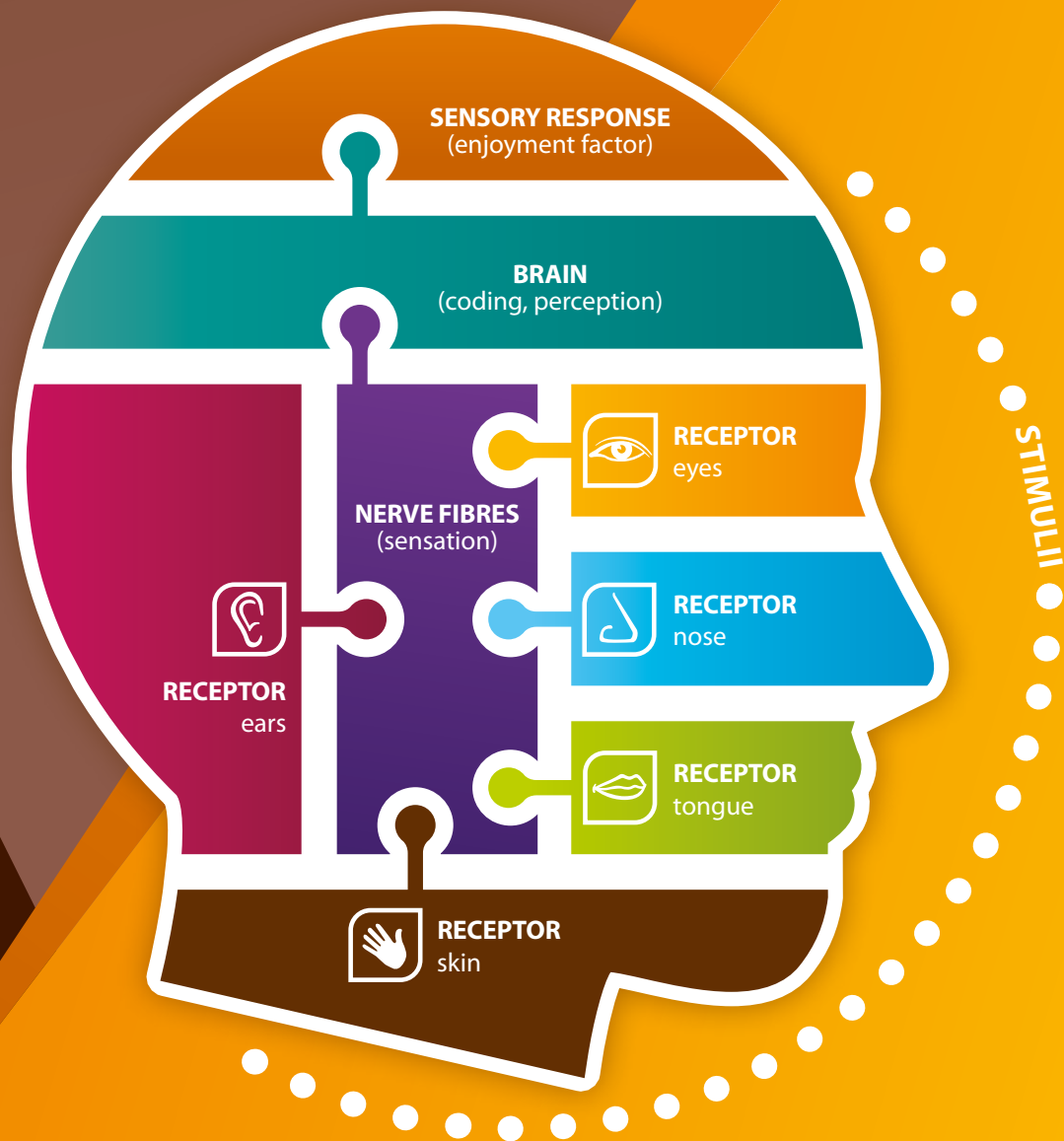
Formulation and process optimisation.

- **Quality**

Evaluation of raw ingredients, finished products...

This technique involves a human panel highlighting and describing the organoleptic properties (appearance, smell, sound, texture, taste) of a product.





The aromas released in the mouth when eating a croissant develop and travel to the nose via the back of the throat, a route described by specialists as the retronasal route. Such aromas are not to be confused with those perceived when smelling the product (scent and smell). The simultaneous perception of tastes, smells and mouth-feel sensations experienced during tasting is collectively known as “flavours”.

Two sensory approaches



Expert
vocabulary



Consumer
vocabulary

Test

Objective analysis of various sensory criteria or attributes undertaken by a measuring instrument

Consumers' assessment of a product's acceptability

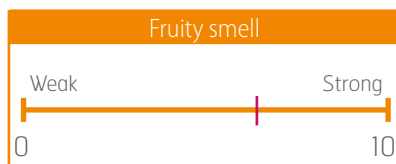
Panel

Expert - 10 to 15 people having undergone 20 hours specialized training and subjected to regular performance checks

No training - 60 people minimum

Product assessment and presentation

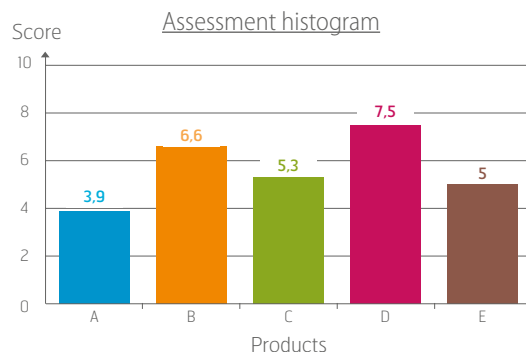
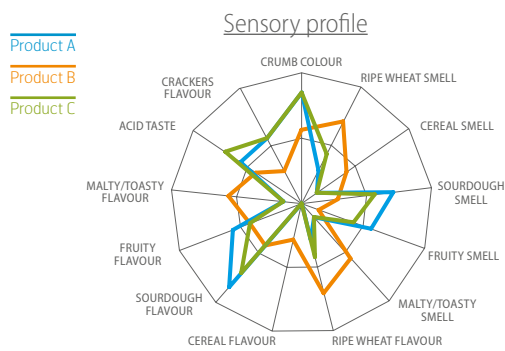
Scoring scale with identified markers (attribute with precise definition)



- Allocation of score on assessment scale
- Reasons for preference (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...

General good tasting practices

Tasters are required to:

- Report any physiological impediments (cold, dental care, etc.)
- Avoid smoking, wearing perfume, eating any strong-tasting products (confectionery, coffee, spicy food etc..) for at least one hour prior to tasting.
- Avoid talking to other tasters when assessing the products and remaining silent during the tasting.
- Assess equivalent amounts for each product.
- Rinse out the mouth with water before tasting each product.
- Take the time judged necessary for each test.

The products should be:

- Presented anonymously (coded samples).
- Presented under the same conditions (temperature, amounts, degree of baking).
- If compared, evaluated in the same stage of preservation.
- Freshly baked croissants: very sensitive to aging. It is essential to compare croissants that have been baked at the same time, with a leeway of + or - ten minutes. The comparison must be carried out any time between 30 minutes after cooling to 12 h after cooling. Ideally, both assessments must be done.
- Croissants with long shelf life: it is recommended to assess them several times across their shelf life until the end of the best before date.
- The assessed croissants should ideally have the same weight and show identical degree of baking.



For filled croissants or danishes, it is recommended to assess the dough alone first, and dough with the filling in a second step.

This reference document on croissant offers a detailed tool for the assessment of the crumb part, but not for the filling, as its taste appearance and texture can have infinite variations.



APPEARANCE

The first factor to be assessed when eating a croissant is appearance.

The assessment occurs in 3 stages: the appearance of the croissant, then the crust and concludes with an examination of the crumb of the croissant.



Shared Experiences



**Stéphane
JOURNOUX**

APAC R&D Director
China Marketing Director,
Délifrance

“ The French croissant is one of the emblems of the French way of life. In Asia, its name is not translated because it evokes French know-how and bakery tradition. Whether in Paris, Moscow, New York or Shanghai, there is a strong demand for the classic French croissant.

It's an iconic product. By making croissants in Thailand and China, we market a French-style delicacy across the world, but we never forget to adapt to each country, culture and customer, such as by reducing sugar or salt.

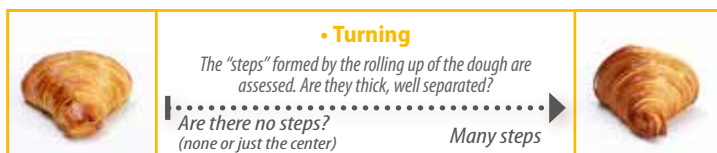
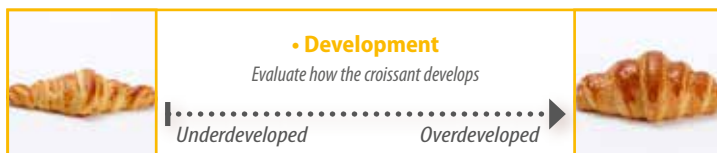
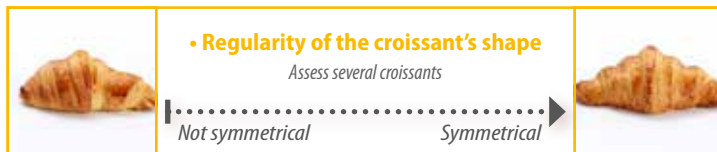
To obtain a traditional French croissant, first select the ingredients: butter and flour. The French will often pick a croissant because of the evenness of its lamination and its enticing buttery taste, savouring it with a cup of coffee. In Asia, you can also use the croissant as a sandwich (stuffed with chicken, tuna, or “egg-mayo”), or revisit it by adding local flavours, such as red bean paste, green tea, matcha. Sold in coffee shops, Asian people like larger products. Indeed, the Asian croissant weighs 90g whereas the French croissant weighs 60g. Decoration is also essential in Asia: the product is not as bare as in Europe. For example, our white chocolate and almond croissant is a must in China! In Asia, there doesn't seem to be a clear distinction between viennoiserie products and danishes.

This attention to local tastes, the proximity of our R&D and sales teams, and our workshops, allow us to better meet consumer expectations. Every day, we are inspired by stories, places, tastes, cultures, meetings... Considering the main trends to follow, products focusing on health and well-being are very popular. Seventy-five percent of Asians are willing to buy baked goods which are good for their health (dried fruits, nuts, seeds...). Our production workshops benefit from the expertise of French bakers but are also enriched by local trends and innovations. Indulgent, very affordable, convenient to eat irrespective of the type: plain, sweet or salty, the croissant is sure to continue to meet great success in Asia! ”

Appearance / General



Expert vocabulary



• **Spontaneous comments from experts**



Consumer vocabulary

• **Twisted, heterogeneous, straight, uniform, regular, symmetrical**

• **Flat, big, large, puffed-up, uniform, heterogeneous**

• **Beautiful appearance, regular, industrial**



• **Small, flat, big, large, round, rounded, puffed-up**



• **Appetising, appealing, pleasant, attractive**
• **Classic, ordinary, authentic, natural**



Appearance / Crust



Expert vocabulary

	<p>• Evenness of the crust colour</p> <p>Assess the colour differences across the upper crust of the croissant (centre, steps, risers ...)</p> <p>Very uneven (brown areas and yellow areas) → Even (entirely gold or entirely brown, for example)</p>	
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	<p>• Evenness of the crust surface. Excessive flakiness/presence of blisters on the surface.</p> <p>A finger is swiped across the surface of the "steps". Do they feel smooth or puffy and irregular?</p> <p>Blistered → Smooth, with no roughness</p>	
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	<p>• Position of the centre part of the croissant</p> <p>Assess the tip of the croissant: is it attached or peeling off?</p> <p>Centre part peeling off → Centre part perfectly attached</p>	
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• Crust colour	<p>e.g. COPPERED</p> <p>e.g. BROWN</p>
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<p>• Intensity of the crust colour</p> <p>Pale → Dark</p> 
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	<p>• Crust thickness</p> <p>Thin → Thick</p>	
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Consumer vocabulary

• **Regular colour**

• **Puffy, creased, pustular, presence of blisters, rough, smooth, regular**

• **Industrial, traditional, artisanal**

• **Golden, brown**
• **Matt, dull, glossy, shiny**

• **Pale, under-baked, dark, lighter dark, well-baked, over-baked**

• **Thin, thick crust**

Appearance / Crumb



Expert
vocabulary

• Crumb colour

e.g.
BEIGE/
CREAM

e.g.
GOLDEN

• Intensity of crumb colour



• Evenness of colour



• Thickness of the layers*

The croissant can be assessed when it is sliced.
What type of layers can be seen?



Many thick layers

All the layers are thin



• Number of layers*



Few layers (caves)

Many layers



• Evenness of the lamination*

When the croissant is sliced, the presence of empty/hollow areas or caves in the centre of the product is assessed



Irregular lamination

Regular lamination



Consumer
vocabulary

• Yellow, white, gold

• Pale, light

• Even

• Heavy, light

• Dense, heavy, compact, light, aerated • No flakiness, some flakiness, excessive flakiness

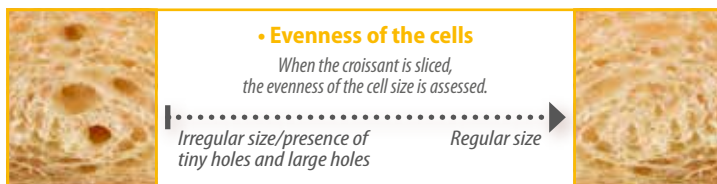
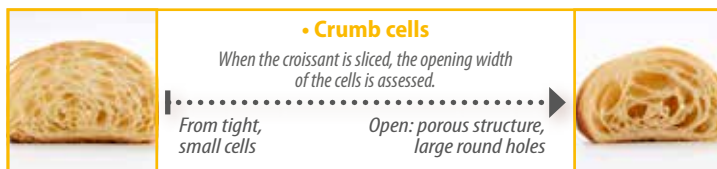
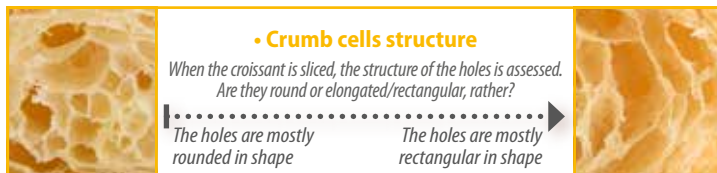
• Holes (few/many), hollows • No flakiness, some flakiness, excessive flakiness, presence of holes, beautiful hole structure, aerated • Well-risen

*: attribute suitable only for laminated products only

Appearance / Crumb



Expert vocabulary



Consumer vocabulary

- **Brioche-like texture, flaky**

- **Holes (few/many), hollows**
- **No flakiness, some flakiness, excessive flakiness, presence of holes, beautiful hole structure, aerated**
- **Well-risen, brioche-like texture, flaky**

- **Holes (few/many), hollows**
- **No flakiness, some flakiness, excessive flakiness, presence of holes, beautiful hole structure, aerated**
- **Well-risen, brioche-like texture, flaky**

Appearance

Illustration



Tiger Croissant

Formula

High protein bread flour	500 g	100 %
Sugar	65 g	13 %
Salt	10 g	2 %
Butter (82% fat)	50 g	10 %
Compressed yeast	22,50 g	4,5 %
Viennese pastries improver	2,5 g	0,5 %
Eggs	50 g	10 %
Milk	220 g	44 %
Traditional living liquid sourdough	50 g	10 %
TOTAL DOUGH	970 g	
75% of the mixed dough for folding	727 g	100 %
Laminating butter	182 g	25 %
For coloured dough (take 25% of the mixed dough)	243g	100 %
Cocoa powder and/or black colouring agent	16 g	6,5 %
Honey	10 g	5,3 %
Butter	25 g	10,2 %
Water	10 g	4,1 %

Diagram

Mixing	Spiral mixer : 10 min in 1 st + 5 min in 2 nd
1 st fermentation	30 mn at 23°C (room temperature)
Folding without any dough rest period	Laminate the coloured dough so that it is slightly larger than the other piece. Place it on the other laminated dough and flip it over so that the black side is underneath. Laminate one last time until the desired thickness is achieved.
Resting	15 min in positive cold before cutting and shaping the croissants.
Division of dough and shaping	Cut the excess dough and cut out 13 croissants which are 25 cm long and 7.5 cm wide. Each croissant must weigh about 75g Roll the croissants and place them on trays Glaze before putting them in a proofer
Proofing	Keep in the proofer for about 2 hours at 27°C Hygrometry: 75% Glaze them a second time before putting them in the oven.
Baking	Deck oven: 15 minutes at 200°C Convection oven: preheating to 180°C and baking for 12 min at 170°C

Tiger aspect
Cacao note
aspect *Tiger aspect*
cacao *Nice volume*
Chocolate flavour *Cacao note*
Chocolate flavour *Tiger aspect*
Tiger aspect *Chocolate flavour*
Nice volume





SMELL

The sense of smell is very important. Together with the product appearance, the croissants' smell contributes to the desire of a great product.

The smell that radiates from the croissant will make us want to dive right into it!

Shared Experiences



Urs RÖTHLIN

Bakery and artisanal
bakery department
responsible
Richemont Center of
Excellence for bakery
& confectionery



“ I am personally a great consumer and fan of croissant! It is not easy to explain the reasons for our preferences... in the case of the croissant, it is probably due to the fact that it is a multi-sensorial product. Firstly you have its two crispy pointed ends. Then thanks to the lamination process, the butter and toasted aromas come through. Finally at the heart of the croissant, the crust is thin, light with a tender buttery crumb. Cherry on the cake: the sweet flavour which calls back for more! ”

For me a croissant, or other pastry from a yeasted and laminated dough, is one of the most technical products in bakery.

The baker must carry out many steps, all of which are key to obtain a beautiful croissant. The croissant is laminated and shaped before being baked, but the steps in between are crucial. The three key factors to success are: time, temperature and humidity.

On one side, the fermentative activity of the yeast within the dough plays a very specific role. The microorganisms brought by the baker's yeast and/or sourdough used, are the fermenting agents which will be present throughout the process; from mixing to baking. During this time they will participate to the natural degradation of starch and gluten. This biochemistry is at the source the croissant's incomparable structure and taste.

On the other hand, we have the physical development of the multiple layers of dough and butter. These layers must be as regular as possible. Fragile and delightful, this makes the shaping of the croissant a delicate step. Finally, it is in the oven that the croissant develops to its final aspect. If all parameters are respected, the baker will obtain a beautiful croissant! ”

Smell

Method to create references for each attribute with a recipe made in an opaque bottle. For an optimal result, follow the order in which the ingredients are to be added when making the bottled recipe.



Expert vocabulary

• Alcohol smell



RECIPE

- ✓ 5 g of premium croissant*
- ✓ 0.5 g of ethanol (70%)

• Almond smell



RECIPE

- ✓ 5 g of croissant crumb
- ✓ 1.5 mg of benzaldehyde

• Caramel smell



RECIPE

- ✓ 5 g of croissant crust
- ✓ 10 mg of furaneol

• Cheese smell (off note)



RECIPE

- ✓ 5 g of croissant
- ✓ 1 pinch parmesan

• Coconut smell



RECIPE

- ✓ 5 g of premium croissant*
- ✓ 1 g grated coconut

• Cooked butter smell



RECIPE

- ✓ 5 g of hazelnut butter (melted until a caramel colour is obtained)

• Fatty smell



RECIPE

- ✓ 5 g of premium croissant* (substitute butter with margarine)
- ✓ 1.5 g of melted margarine

• Fermented smell



RECIPE

- ✓ 5 g of over-yeasted croissant
- ✓ 2 g dried yeast
- ✓ 1 g of water poured at the last moment
- Mix together

• Fresh butter smell



RECIPE

- ✓ 5 g of premium croissant*
- ✓ 2 g of melted butter

• Fresh cream smell



RECIPE

- ✓ 5 g of premium croissant*
- ✓ 10 mg of pentandione



Consumer vocabulary

• Alcoholic

• Frangipane, almond

• Caramel, caramelized

• Cheese, stale

• Margarine, coconut

• Butter, caramel, cooked

• Fat, oil, grease

• Fermented, fermentation, yeasted, bread

• Butter, buttery, brioche

• Milky smell, dairy

*see the croissant premium recipe mentioned on page 22



Expert vocabulary

• Fresh yeast smell



RECIPE
✓ 2 g of fresh yeast
✓ 5 g of premium croissant*

• Fruity smell



RECIPE
✓ 5 g of premium croissant*
✓ 1 teaspoon apricot jam

• Hazelnut smell



RECIPE
✓ 7 g of premium croissant*
✓ 2,5 g of hazelnut powder
Mix

• Rancid smell (off note)



RECIPE
✓ 5 g of croissant
✓ 3 mg of octanoic acid

• Sourdough smell



RECIPE
✓ 2 g of ready-to-use live liquid
sourdough, with a TTA of 30
✓ 4 g of premium croissant*

• Tangy smell



RECIPE
✓ A pinch of calcium propionate
rubbed on the back of the hand

• Vanilla smell



RECIPE
✓ 5 g of premium croissant*
✓ 1 g vanilla sugar

• Vinegar / Acetic smell



RECIPE
✓ 5 g of premium croissant*
✓ 0,8 g of apple cider vinegar

• Other flavours brought about by the filling
(specific vocabulary to build)

• Spontaneous comments by experts



Consumer vocabulary

• Fermented smell, yeast

• Dried fruits, fruity

• Hazelnut, praline, almond

• Stale, old

• Sourdough smell, tangy, acidic

• Tangy smell, acidic, chemical

• Vanilla, vanilla-flavour, caramel, spicy

• Tangy smell, sourdough, acidic

• Chocolate, red fruits, lemon, ...

• Chemical, synthetic, old, fragrant, appealing,
appetising, fresh

Smell

Illustration



Premium Croissant

*is a recipe proposed by Franck Dépériers,
Meilleur Ouvrier de France,
owner of La Petite Boulangerie in Nantes*

Formula

T55 flour	500 g	50%
High protein bread flour	500 g	50%
Sugar	130 g	13%
Honey	30 g	3%
Compressed yeast	22 g	2,2%
Whole milk	250 g	25%
Water	220 g	22%
Salt	22 g	2,2%
Liquid sourdough	150g	15%
TOTAL DOUGH	1824 g	

Diagram

Mixing	Spiral : 17 min in 1 st	Oblique : 20 min in 1 st
Dividing & Resting	Dough pieces of 3 kg each. Keep in a cold cell until the dough reaches a temperature of 5°C	
Storage	Refrigerate overnight	
Laminating	750g of butter per each piece of dough Make the croissants with a double fold followed by a single fold.	
Cutting	Each piece must be about 75 g, place on a tray afterwards	
Refrigeration	at 5°C	
Fermentation	4h at 25 °C	
Glazing	Egg wash (whole egg, mixed together)	
Baking	Deck oven, at 200°C for 18 minutes	

Golden crust Caramelized
Golden crust
Dairy note Caramelized
Smell of fresh butter
Golden crust Dairy note
Caramelized Golden crust



SOUND

Sound is an important part in the assessment of French-style croissants. The Crispness assessed through touch and mouth-feel provides us information on the product's freshness.



Shared Experiences



Nicolas BOUSSIN

Executive Pastry Chef
at Maison de la Crème,
Meilleur Ouvrier
de France



“ Croissant is for me the first link between pastry and bread makers. Like the baguette or the chocolate éclair, it is a reference product for the customer to evaluate the overall quality of a shop.

In this context, croissant can be worked in a variety of ways: rustic, classic and modern. In the recent years, we even introduced new colours and flavours, which give it new image.

The qualitative criteria are, in general, the presence of cells in the crumb and, of course, the crispy puff pastry.

The classic half-moon shape was abandoned in favour of the margarine croissant. This is a shame, because it was of a generous and enticing shape.

“Modern” croissants are of different shapes and sizes.

I prefer a croissant which is not too short, with a thin and crispy puff pastry which is well-mastered. I don't like when the croissant looks like a ball, or when it is too short or tall...

When it comes to taste, there must be a balance between the buttery smells (hazelnut, dairy) and fermented notes.

Having a good knowledge of the appropriate technique to be used, being able to choose the type of flour, the mixing as well as the fermentation process are important. This expertise will be seen in the number of folds made, in the choice of butter, which must ensure a smooth lamination thanks to its plasticity, but also in the choice of the type of “folding” (double/single fold) and the number of folds.

Proofing and baking are the last elements that will customise the croissants. This last step will highlight the taste quality of the butter and the fermentation.

I prefer baking in the traditional oven even if it is more difficult process. A lovely glaze will guarantee the presence of warm, appetising-looking crust colours. ”

Sound / Touching the crust



Expert
vocabulary

• Crispness*

Assess the Crispness of the croissant when rapidly squeezing it between the fingers and thumb.

Assess the sound heard: the louder the sound, the crispier the croissant.


 No noise Strong, crackling sound



Consumer
vocabulary

• Crispy, crunchy, crackling sound

Sound / Mouth-feel of the croissant



Expert
vocabulary

• “Crunchy/melt-in-the-mouth” texture*

A crunchy texture is typified by a thin, crispy film making up the crust of the croissant and a melt-in-the-mouth crumb.


 Uniform texture, bland texture Crunchy/
melt-in-the-mouth texture



Consumer
vocabulary

• Crispy, crunchy, crackling sound

*: suitable descriptors for laminated products only

Raspberry Delight

Formula

Flour	1 000 g	100,0 %
Water	500 g	50 %
Salt	20 g	2 %
Compressed yeast	40 g	4 %
Sugar	120 g	12 %
Butter	50 g	5 %
Viennese pastries improver	5 g	0,5 %
TOTAL DOUGH	1 735 g	
Coloured dough: take 25% of the final dough and colour as you wish	In sufficient quantity	In sufficient quantity
Laminating butter (depends on the weight of the dough)	500 g	29 %
Raspberry jam	In sufficient quantity	In sufficient quantity

Diagram

Mixing	Spiral: 4 min in 1 st + 7 min in 2 nd
Dough temperature	23 °C
1 st fermentation	20 min at room temperature, then 15 min at -20°C.
Folding & Laminating	1 double fold and 1 single fold
Coloured dough	Place the coloured dough on the laminated dough
Dividing	Roll out the dough and cut rectangles of 25 cm by 5 cm
Scoring	Score the outer part
Filling – shaping	Spread a thin layer of raspberry jam, then roll lengthwise, and place in Pandoro tins
2 nd fermentation	2 hours at 26°C
Baking	Ventiladed oven: with a tray on top, 20 min at 180°C



Crunchy Crispy
Crispy Crunchy
Crunchy
Crispy
Crunchy Crispy
Crunchy



TEXTURE

First perceived through the sense of touch, then in the mouth, a croissant's texture is an essential factor.

The croissants' texture must be considered globally: is it crispy? Of course, the crust and the crumb must each be analysed independently as well.



Shared experiences



Isabelle DUSSOUS

Product Quality
Director - Bridor



Françoise DELEAU

Product Quality
Manager - Bridor



Pascaline KOSMICKI

Group Marketing
Manager - Bridor

“ In France, pastries are cultural. Both men and women, regardless of age or socio-professional category, consume croissants for their own indulgence and, most of the time, to share with the family. For the French, “pure butter” is a prerequisite to a good croissant, with a beautiful golden and shiny colour (whereas a margarine croissant will have a more matt crust).

The delicious smell of fresh butter emanating from the croissant, as well as its generous visual impact, with a beautiful golden colour, are the first consumer experience essential to create desire for the product. The croissant should not be too large; it shouldn't be allowed to proof for an excessive amount or else it would be too aerated, less tasty and the flavours will not be as intense.

A croissant must be crispy on the outside and melt in the mouth. Balanced, lingering flavours of butter and sugar come across. At Bridor, the tasting of our signature recipe, *Eclat du Terroir*, ends with the unique note of caramel butter.

For an enhanced experience, a good croissant must be eaten within 3 hours after being baked to benefit from all its organoleptic qualities. Otherwise it dries out, loses Crispness from the absorption of external moisture, loses its lovely smell of butter, its shine and the great visual aspect that creates such desire for the product.

The French are still devoted to the plain croissant, which is mainly eaten at breakfast. They may also add butter (!) or jam according to their desires. In other countries, however, croissant is consumed differently: it is served as a sandwich base in the US or the UK, filled and decorated in Italy, mixed with seeds and has a brown crumb in Northern Europe or even herbs such as Zaatar (a blend of thyme, oregano, sumac and sesame) in the Gulf countries. In Asia, all kinds of recipes derived from the croissant dough can be found: all forms, colours, flavours are available.

This is where we launched our *Bun'n'Roll*, a spiral-shaped puff pastry bun made from a delicious croissant dough. Originally developed to make

hamburgers, it can be used in all kinds of sweet recipes which are even more indulgent. Combined with salty toppings, the croissant dough, with its sweet and buttery flavours, completes the taste of the hamburger. Its crispy texture and aerated lamination create a new tasting experience. *Bun'n'Roll* has since been deployed in North America and Europe, enjoying great success.

Sensory analysis is an essential step in the development process at Bridor. Indeed, since maintaining our premium positioning is our priority, we strive to achieve the best product, in line with our customers and final consumers expectations.

Product development is punctuated with tastings by small expert committees throughout the product development, and the final version is validated by a consumer panel (either using a triangle test when it comes to a recipe change, or a comparison to what the competition has to offer if it is a new product). As a last step of the validation process, a customer study can also be carried out. Expert panels allow us to complete our research on the organoleptic characteristics of our new product.

The analysis does not stop there: once launched, all our manufactured products are controlled by our laboratory on a daily basis. Each batch is placed on a tray, baked and analysed. Visual (volume, lamination, presence of holes...), smell and taste tests are carried out. Lastly, for some targeted products (new products; recipe changes or manufacturing line changes...), aging tests are carried out several times over the product's lifetime, which can be to 12 months.

Thereby, Sensory analysis, plays a key role in Bridor's development. **”**

Texture / Whole croissant to the touch



Expert vocabulary

• Flakiness

Assess the behaviour of the crust: size and quantity of crumbs formed when the croissant is squeezed between the fingers and thumb. When the crumbs are small and numerous, the croissant is more friable.

.....
 Few crumbs/crums, not too flaky Many crumbs/crums, flakes



• Resistance to vertical pressure

Assess the behaviour of the crust when the surface is pressed with the hand.

.....
 Hard Soft



• Resistance to deformation

Assess the behaviour of the croissant when the sides are squeezed between the thumb and the finger. Is it easy to deform? Does it come back rapidly to its initial shape?

.....
 Not flexible Flexible



• Resistance to tearing

Assess the behaviour of the crust when you tear the croissant in two pieces. Does the crumb resist or can it be easily torn in two?

.....
 Resists Tender



Consumer vocabulary

• Few crumbs, many crumbs, friable, crumbles

• Hard, sturdy, firm, soft, creamy soft, supple, delicate, easily crushed

• Hard, sturdy, firm, soft, creamy soft, supple, delicate, easily crushed

• Hard/easy to tear, supple

Texture / Crumb to the touch

• Elastic texture

Press the middle of the croissant gently with the index and assess the amount of pressure required to distort its shape.

.....
 Elastic, springs back very quickly Gummy: the croissant takes time to spring back, or doesn't spring back.



• Elastic, pasty, greasy, oily

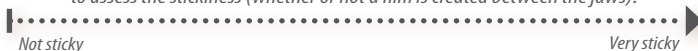
Texture / Mouth-feel of the crumb



Expert vocabulary

• Sticky texture

Assess the stickiness of a piece of crumb between the teeth.
Chew the piece of crumb 10 times, by gently biting up and down (several times) to assess the stickiness (whether or not a film is created between the jaws).



• Resistance to bite

Assess the resistance of a piece of croissant (crumb + crust) when biting into it (the first bite), then when chewing.



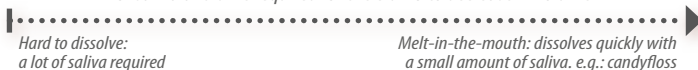
• Chewing resistance

Assess the resistance of a piece of crumb when it is being chewed.



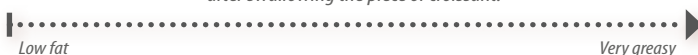
• Melt-in-the-mouth/absorption

Place a piece of crumb against the palate and let it dissolve while assessing the amount of saliva and time required for the crumb to decrease in volume



• Greasy texture of the crumb (attribute to assess with the previous one)

Assess the greasy mouth-feel when a piece of crumb is allowed to dissolve (without chewing) on the palate. Also evaluate the perceived sensation after swallowing the piece of croissant.



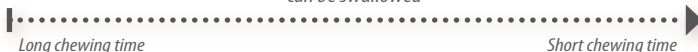
• Dough-like texture

Assess the development in the structure of a piece of crumb placed in the mouth without chewing



• Chewing time

Assess the chewing time required before the piece of croissant (crumb + crust) can be swallowed



Consumer vocabulary

• Sticky, pasty

• Dense, compact, light, aerated

• Filling, dense, compact, heavy, over-filling, rubbery, light, aerated, unctuous, brioche-like texture

• Stale, dry, floury, melt-in-the-mouth, fresh, moist

• Buttery, greasy, oily (not at all, somewhat, very)

• Light, aerated, unctuous, pasty, heavy, dense, compact, filling, over filling

• Rubbery, light, aerated, unctuous

Texture

Illustration



Fresh
Crispy & Aerated
Crunchy *Crunchy*
Crunchy **Fresh & Crispy**
Crispy & Aerated
Crunchy
Fresh & Aerated

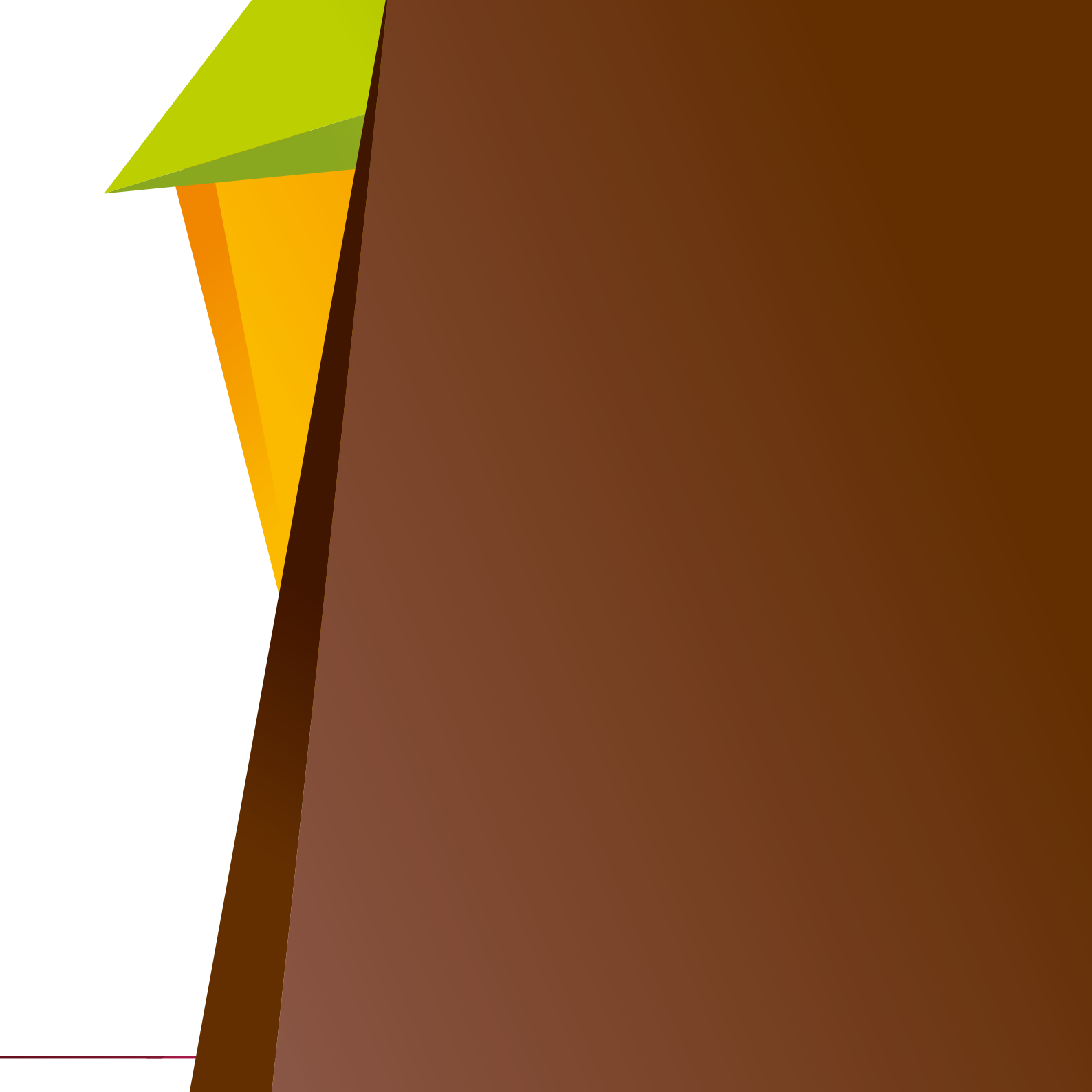
BUN'N'ROLL , *a recipe by Bridor*

Formula

Flour	2000 g	100%
Water	1100 g	55%
Salt	40 g	2%
Compressed yeast	70 g	3.5%
Sugar	180 g	9%
Milk powder	30 g	1.5%
Butter	40 g	2%
TOTAL DOUGH	3 460 g	
Laminating butter (25% on the weight of the dough)	865 g	100%
TOTAL	4325 g	

Diagram

Mixing	Spiral: 4 min in 1 st + 6 min in 2 nd
Dough temperature	22 °C
1 st fermentation	180 min: 90 min at 24°C + 90 min at 4°C
Folding & Laminating	50 min: 2 double folds or 3 single folds, with a rest period of 15 min at 4°C between the folds. Let stand for 30 min in the fridge before the final lamination (5 mm)
Dividing & Shaping	25 min: 3 strips wrapped and placed side by side in the mold
2 nd fermentation	75 min at 27 °C
Baking	20 min at 230°C in a deck oven/use a beaten egg wash for shine





TASTE

The taste of the croissant is a major factor determining a purchase, especially a repeat purchase.

Our taste buds indicate to us the aromatic characteristics of the croissant and whether we enjoy it!





Shared Experiences

“ In Argentina, we consume an adapted version of the French croissant called medialuna, which means “half-moon”.

The composition is close; however, the crumb is softer and more moist, and the croissant contains a higher percentage of butter and a very sweet taste.



Gastón MIÑO

Argentinian baker
competing in the gourmet
category at the
Masters of Baking.
Saf Argentina

We also glaze the croissants with syrup when they have finished baking.

I use all of the 5 senses to assess the quality of a good croissant. First of all, the sight, then the touch and finally the sound. The crust should be crisp and with an excellent lamination, and the crumb must be fresh and moist.

As for texture, the croissant must feel crunchy in the mouth. Regarding smell and taste, the croissant must first be buttery, creamy with sweet notes alongside lactic notes, slightly acidic and with some flavours of dried fruits. Tasting must be a complex and long-lasting experience!

Another difference between the French croissant and the Argentinian medialuna is the appearance of the crumb: the crumb of the French croissant has more irregular cells, while the crumb of the Argentinian croissant is tight and closed.

Moreover, it is interesting to note that in Argentina the croissants are not filled.

Croissant or medialuna, the tradition is to eat them at breakfast accompanied by coffee or coffee with milk. ”

Taste / Crumb

Each expert attribute is illustrated by reference croissant.



Expert vocabulary

• Almond flavour



RECIPE

✓ Croissant made with 0.08% benzaldehyde

• Caramel flavour



RECIPE

✓ Croissant with 0.8% furaneol

• Cheese flavour (off note)



RECIPE

✓ Croissant made with 0.08% butyric acid

• Coconut flavour



RECIPE

✓ Croissant made with 0.1% gamma-octalactone

• Cooked butter flavour



RECIPE

✓ Brush a premium croissant* with hazelnut butter

• Fermented taste



RECIPE

✓ Croissant made with 8% of compressed yeast

• Fresh butter flavour



RECIPE

✓ Premium Croissant*

• Fresh cream flavour



RECIPE

✓ Croissant made with 0.8% of 2.3 pentanedione



Consumer vocabulary

• Frangipane, almond

• Caramel, caramelized, cooked, grilled, toasted

• Cheese, rancid

• Margarine, coconut

• Butter, caramel

• Fermented, yeasty flavour

• Butter, buttery, fresh butter, brioche-like flavour, milky bread

• Milky, dairy

*see the croissant premium recipe mentioned on page 22



Expert vocabulary

• Fruity flavour



RECIPE

✓ Croissant made with 0.4% ethylphenylglycidate

• Greasy flavour



RECIPE

✓ Premium croissant*, substitute butter with margarine

• Hazelnut flavour



RECIPE

✓ Croissant made with 0.15% 5-methylquinolaxine

• Rancid flavour (off note)



RECIPE

✓ Croissant made with 0.15% octanoic acid

• Sourdough flavour



RECIPE

✓ Croissant made with 15% of a ready-to-use live liquid sourdough, with a TTA of 30

• Tangy flavour



RECIPE

✓ Croissant made with 0.3% Calcium Propionate

• Vanilla flavour



RECIPE

✓ Croissant made with vanilla beans in the dough. Ratio: 0.48g vanilla pod for 30 croissants

• Other flavours brought about by the filling (specific vocabulary to build)

• Spontaneous comments by experts



Consumer vocabulary

• Fruity

• Grease, oil, margarine, fat

• Hazelnut, praline

• Rancid, cheese, old

• Sourdough, tangy, acidic

• Tangy, acidic, chemical, bitter

• Vanilla, vanilla-flavour

• Chocolate, red fruits, lemon, ...

• Old, stale, unpleasant, good, balanced, pleasant, generous, indulgent, delicious, spicy



Flavour / Crumb



Expert vocabulary

• Acidic taste



HIGHLY ACIDIC RECIPE
✓ Croissant with a pH of 4

• Salty taste



VERY SALTY RECIPE
✓ Croissant made with 2.4 % salt

• Sweet taste



VERY SWEET RECIPE
✓ Croissant made with 5 to 10 % sugar

• Spontaneous comments by experts



Consumer vocabulary

• Tangy, acidic, bitter flavour

• Bland, neutral, salty

• Bland, neutral, not enough sugar, too sweet, sweet

• Lingering taste

Taste

Illustration

Zaatar (Lebanese specialty)

Formula

High protein bread flour	2000 g	100 %
Water	560 g	28 %
Ice	300 g	15 %
Compressed yeast (high sugar dough)	80 g	4 %
Sugar	240 g	12 %
Salt	40 g	2 %
Egg	100 g	5 %
Pastry improver	20 g	1 %
Zaatar mix	160 g	8 %
Olive oil	120 g	
Thyme	12 g	
Oregano	2 g	
Sumac	6 g	
Toasted sesame	24 g	
Lemon zest	½	
TOTAL DOUGH	2994 g	
Laminating butter (based on dough weight)	900 g	30 %
TOTAL	3894 g	

Diagram

Mixing	Spiral: 4 min in 1 st + 4min in 2 nd
Dough temperature	18 °C
1 st fermentation	15 min at -25 °C
Folding & Laminating	1 double fold 1 rest time of 10 min at -28°C and 1 fold 1 rest time of 30 min at 2°C
Dividing	90 g
2 nd fermentation	1h45 at 28°C
Baking	Ventilated oven, 15 min at 180 °C



Spicy & Acidulous
Sesame & Oregano
& Acidulous flavour
Spicy & Acidulous
Sesame **flavour**
Spicy & Oregano flavour

"LE CROISSANT" *in words*

A GLOSSARY OF SENSORY TERMS TO DESCRIBE CROISSANTS AND OTHER YEASTED AND LAMINATED PRODUCTS

Renowned for their sensory expertise, Lesaffre and Hubert Chiron have developed a glossary of sensory attributes adapted to yeasted and laminated doughs. This tool is used to combine two approaches: the more subjective approach of consumers and the more objective angle of experts.

Browse this booklet, sample and enjoy!



Already published:

"Le pain" in words, to describe crusty breads

Sandwich Bread in words, to describe sandwich breads



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