Handbook of Molecular Gastronomy
Scientific Foundations, Educational Practices, and Culinary Applications
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Publication details
Hervé This vo Kientza, Pierre Gagnaire
Published online on: 09 Jun 2021

How to cite:- Hervé This vo Kientza, Pierre Gagnaire. 09 Jun 2021, Molecular Mixology: Welcome Coffee, a Cocktail with Ten Layers from: Handbook of Molecular Gastronomy, Scientific Foundations, Educational Practices, and Culinary Applications CRC Press
Accessed on: 11 Oct 2023

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Molecular Mixology: Welcome Coffee, a Cocktail with Ten Layers

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Cocktails were once simple mixtures of aqueous solutions (mainly fruit juices) and spirits. Progressively, other ingredients, such as cream, sugar, or herbs, were added, but with the advent of molecular cooking, new tools have been used, and various additions such as alginate pearls have been proposed. Here, we describe a cocktail with ten layers, i.e., many more than the three of the famous Irish coffee. The technological idea is by H. This, and we give a recipe using this idea by P. Gagnaire.

Cocktails are defined as alcoholic drinks consisting of a spirit or spirits mixed with other ingredients, such as fruit juice or cream (Oxford Dictionaries, 2018). Many of them are said quite arbitrarily to contain at least three flavours, one of which is ethanol, or to contain alcohol, a sugar, and a bitter/citrus component (Robuchon, 2007). When a mixed drink contains only a distilled spirit and a mixer, such as soda or fruit juice, it is said to be a highball. When a mixed drink contains only a distilled spirit and a liqueur, it is a duo, and when a mixer is added, it is a trio. Additional ingredients may include sugar, honey, milk, cream, and various herbs. Mixed drinks without alcohol that resemble cocktails are known as “mocktails” or “virgin cocktails”.

The origin of the word a“cocktail” is disputed, but the first recorded use of cocktail not referring to a horse with cut tail is found in 1798 (The Morning Post and Gazetteer in London, 1798; Brown and Miller, 2009), and the Oxford English Dictionary cites the word as originating in the United States (Oxford Dictionaries, 2018). The first recorded use of “cocktail” as a beverage (possibly non-alcoholic) in the United States appears in 1803 (Wondrich, 2007). A definition of a “cocktail” known to be made in reference to an alcoholic beverage appeared in 1806 (Croswell, 1806).

After 1980, new equipment (often from chemistry laboratories), techniques, and know-how were proposed to be applied to food and drinks under the names “molecular cooking” and “molecular mixology”, respectively, and they have been quickly adopted by chefs and bartenders to create interesting cocktails. In particular, alginate systems, siphons, and liquid nitrogen have been extensively used all over the world, being now complemented by “note by note mixology”.

Here, we describe how cocktails of many layers can be produced using the simple scientific concept of density. After the creation of the drink called “Welcome coffee” shown by one of us (H. This) at the bar of the Ritz Hotel in Paris (2005) at a training seminar, a savoury recipe using the same technical idea was used by P. Gagnaire.

More Layers than Usually Done: The Welcome Coffee

The Welcome coffee was designed as an educational tool in 1997, but it was created only in October 2005 by the bartender of the Paris Ritz hotel, because a seminar for bartenders had been organized in this hotel. In the Welcome coffee, very simple ideas were used, and in particular the ranking of layers by order of densities: water, oil, ethanol, and air. This first group of possibilities is increased when layers at different temperatures are used and also when sugar is dissolved. Moreover, colloidal layers can include more than one fluid and have different densities. For example, a foam is generally less dense than an emulsion.

For the initial “Welcome coffee”, the bottom layer was proposed to be gelled coffee, prepared using gelatine and a coffee infusion. Because it was easy to make many layers of gels, another one (of chocolate) was put over the coffee gel. On top of this, a cold chocolate drink layer was poured, over which the same liquid, but this time heated, was added. Because of the variations of density with temperature, these two layers did not mix immediately, and the bottom gelled layer was protected from melting. But of course, in order to avoid the melting of a gelatine gel, agar-agar can be used as a gelling agent instead of gelatine.

Over this hot chocolate layer, a liquid with density lower than water (present in chocolate) had to be used; this was an emulsion obtained from coffee beverage, gelatine (as surfactant), and an oil in which coffee had been macerated for one week. This emulsion has a density almost equal to the density of oil, so that it could float over hot chocolate without mixing.

For the next layer of lower density, vodka was used; poured slowly on the coffee emulsion, it could remain there without
mixing, and finally, a foam was made: gelatine was dissolved in coffee and foamed using a siphon with a nitrous oxide (N₂O) cartridge.

But here again, many foams can be added without mixing, and even other liquids could be used. In the first “Welcome coffee” originally served at the Ritz, only a “wind crystal” (a very light meringue obtained by adding coffee and sugar to whipped egg white before cooking) was added. Finally, some grilled almonds with a mixture (2/1, w/w) of tartaric acid and sodium hydrogen carbonate were sprinkled just before serving for a sparkling effect.

### A Cocktail for Restaurants

After this cocktail was proposed in one of our monthly discussions, another recipe was designed with layers for daily serving in a restaurant. This was called “Strawberry, foie gras, pistachio”.

#### Ingredients for six people

- 500 g of strawberries
- 200 g of raw foie gras
- 60 g of chicken broth
- 30 g of red Port wine
- 200 g of full fat milk
- 2 egg yolks
- 15 g sugar
- 20 g of pistachio paste
- 1 untreated orange
- 1 untreated lemon
- 200 g of olive oil
- 12 g gelatine
- 3 teaspoons of kirsch spirit
- 20 g of roasted pistachios tartaric acid
- sodium hydrogen carbonate
- 6 wind crystals
- salt, pepper
- 6 tumbler glasses

#### Preparation

**Recipe 1 – Gelled Strawberry Juice**

- Mix the strawberries and filter.
- Soak 4 g of gelatine in cold water.
- Heat 240 g of strawberry juice and dissolve the soaked gelatine.
- Cool, and pour into six glasses.
- Keep in the fridge until the gel is made.

**Recipe 2 – Foie Gras Cream**

- Using a sieve, transform the foie gras into a paste.
- Boil the chicken stock and the Port wine.
- Add the hot liquid to the foie gras and mix, so that a smooth cream is obtained.
- Add salt and pepper to taste.
- Pour this cold cream on the strawberry jelly.
- Store in the fridge.

**Recipe 3 – Custard with Pistachio**

- Whip two yolks and sugar.
- Boil the milk.
- Add the boiling milk to the mixture of yolks and sugar.
- Cook the custard.
- Dissolve the pistachio paste in the hot custard.
- Cool, and distribute in the glasses.

**Recipe 4 – Olive Oil with Citrus**

- Prepare 10 g of orange peel and 10 g of lemon peel.
- Heat the olive oil with the 20 g of peels at a temperature of 80 °C.
- Let this cool.
- Filter.
- Soak 4 g of gelatine in cold water.
- Press the orange and the lemon, filter the juice.
- Heat the juice, and dissolve the soaked gelatine.
- Make a gel on ice.
- Using a whisk, emulsify the olive oil into it.
- Pour this emulsified emulsion into the glasses (about two spoons per glass).
- Keep in the fridge.
- When the gelled emulsion is set, add a teaspoon of kirsch.

**Recipe 5 – Strawberry Mousse**

- Soak 4 g of gelatine in cold water.
- Bring to the boil water and sugar, and dissolve the soaked gelatine.
- Whip on ice.
- Put the foam on the kirsch.

#### Finishing

Into each glass, put a strawberry wind crystal (obtained by whipping one egg white with a strawberry juice and sugar, and cooking like a traditional meringue), pistachios, and a small quantity (for example, a quarter of a teaspoon) of the mixture of tartaric acid and sodium hydrogen carbonate (2/3; 1/3).

Of course, producing such a system of layers takes time, and even if the elementary steps are simple, the production should be careful in order to get a really fine cocktail.

#### REFERENCES


