



European Jellyfish

COOKBOOK

New perspectives on marine food resources



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 **ISPA**
INSTITUTE OF SCIENCES OF
FOOD PRODUCTION



MAREVIVO



Slow Food®
Lecce

European Jellyfish Cookbook

The first "western-style" recipes based on jellyfish as food

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European Jellyfish Cookbook

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Preface

When you read about “foods of the future”, it is not easy to determine how remote or near that future time can be. When you read about “new foods”, the feeling is that our eating habits will soon change. But by scrolling through a non-traditional recipe book, like this one, suddenly you become aware that moment, the future, is now.

Animal protein is produced from the sea for over three billion people, but the exploitation of these resources is now at the maximum limit of sustainability. We fish too many fish, they are smaller and smaller, we catch them deeper and deeper, often using destructive tools, such as trawling. In practice, we are emptying the tank and compromising any possible future filling.

With a world population that grows at exponential rate (we will be just under 10 billion in 2050), and with a much slower food production (that grows only thanks to continuous technological innovations and the use of mainly non-renewable energy sources), the only way out is to find different, new, sustainable food resources.

The biological cycle of jellyfish and their growing diffusion and abundance in coastal seas (also due to the ongoing global warming) allows us to think of these fascinating creatures as a possible new food source, whose favorable biochemical and nutritional characteristics are now well recognized. Indeed a new resource, but not original for everyone: the use of jellyfish as food is documented since about 2000 years in the Far East, with a production that today reaches almost 1 million tons of jellyfish (between fishing and aquaculture), for a market value of about 100 million euros.

We are omnivorous animals and, apart from a few exceptions (e.g. cellulose), we are able to digest and extract energy from almost everything we can chew. After all, food preferences are only a cultural question: for some human populations it is customary to consume beef, chicken or pork for others, dishes based on horse, mutton or rabbit are common elsewhere. Maybe the time has come to add a new item to our own menu: jellyfish! Enjoy your meal!

Stefano Piraino
Professor of Zoology,
University of Salento, Lecce, Italy

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Introduction

This booklet is the outcome of scientific results, analyses and studies on some Mediterranean jellyfish species carried out at the Institute of Sciences of Food Production of the Italian National Research Council (CNR-ISPA, Unit of Lecce), combined with the spontaneous, creative and passionate interest of some Italian and international professional chefs to experiment jellyfish as a possible new food resource. Given the interest aroused in chefs and the general public, I believe this is only the beginning of a series of culinary ideas on this topic.

Based on scientific results, the new methodologies to process jellyfish for food and food ingredients, and the remarkable nutraceutical properties of some jellyfish components, could make real the possibility of their food use, even in Europe.

The creative spirit of professionals of the gastronomic art, supported by scientific knowledge we are developing, will make possible to consider a wider scenario of natural resources and to start a new era of environmentally-friendly food systems.

But together with this, and before this, it is necessary to reflect on the importance of basic science. Knowledge of the biology, ecology and behavior in the environment of organisms, or "knowing why", also allows a more conscious applicative research, or "knowing how". But the applied science is impossible - and unfortunately also dangerous - without a solid basic scientific knowledge.

Antonella Leone
Researcher at National Research Council,
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CNR - ISPA

The Institute of Sciences of Food Production (CNR-ISPA) carries out research, innovation and know-how transfer to improve the quality and safety of food products.

Through synergistic actions of science and production business, the CNR-ISPA also supports technological innovation paths of companies in the food sector. In the framework of national, European and transnational projects, the research activity of the CNR-ISPA focuses on food safety, quality enhancement of local products, the development of new functional foods and novel foods, and the study of natural bioactive compounds and their role on human health (nutraceuticals).

In particular, the development of "novel foods" and the study of bioactive compounds of marine origin and with nutraceutical function represents a new frontier of research with possible positive outcome in the productive systems.

The CNR-ISPA is also engaged in the development and application of biotechnological processes for the production of functional molecules (e.g. antioxidants, proteins, enzymes, etc.), use of eco-sustainable management of food production, driven by an innovation strategy to support sustainable development of local agri-food communities.

Composed by 5 operational units (located in Bari, Lecce, Turin, Milan and Sassari), the CNR-ISPA collaborates with many national and international Universities and Research Bodies.

Stemming from original studies of CNR- ISPA-Unit of Lecce, in collaboration with the University of Salento and stakeholders in the field of food production, recent research activities led to the writing of this book to promote the sustainable use of neglected marine resources, such as edible jellyfish.

Jellyfish or plastic in the menu of the future?

The struggle of the NGO Marevivo

Marevivo is a non-Governmental Organization founded in 1985 aimed at the conservation of the sea and its resources, linking the institutions policy makers to the general public.

Thanks to its role as impartial actor, the association has been fighting for years, with honesty and intellectual autonomy, for the protection of the sea by generating a strong network of relationships with institutions, citizens and stakeholders, on a national and international scale. Powerful campaigns against plastics or promoting the protection of biodiversity and of the sea health are renowned at national level.

"The Marevivo association of volunteers, in collaboration with research institutions and universities, has been monitoring the jellyfish phenomenon in the Mediterranean for years" says Rosalba Giugni, president of Marevivo. "Looking at the huge amount of jellyfish in the sea of Capri island, the idea of using them as food, despite my vegetarian regime, it occurred to me there, and with a certain unconsciousness I quickly tried to cook them: they had the taste of the sea! "

In 2013 Marevivo launched a first message on the sustainable use of marine biodiversity resources, together with Gennaro Esposito, proposing a dish based on jellyfish during the edition of "Tavola Blu" at Eataly.

Marevivo is one of the most active partners of the CNR-ISPAs in the dissemination activities of the EU project GoJelly.

With the support of Rosalba Giugni,
President of NGO Marevivo



Jellyfish: is it safe food?

Fresh raw jellyfish

All the jellyfish, to a greater or lesser extent, contain stinging substances; although edible jellyfish are generally little or no stinging at all. Several species of jellyfish are safe to eat, but you have to be very careful, to reduce the risk of poisoning or foodborne diseases, it is important to eat only jellyfish species that are well-known and tested as food and, above all, jellyfish products that have been cleaned and processed according to a recognized and validated food process.

Currently, jellyfish are not marketable in European Countries!

It is better not to improvise!

What about jellyfish already on the market?

Almost all jellyfish currently available on the market are from Asiatic markets and processed through dehydration with salt and alum, a food grade substance that serves to stabilize jellyfish tissues and increase their shelf life. However, aluminium salts can release toxic aluminium residues even in the finished product. For this reason, before being consumed, alum treated jellyfish must be rehydrated and washed extensively in running water. However, too high levels of aluminium residues often remain in the final product.

The novel foods and their safety in Europe

Jellyfish are considered "novel foods" according to the European Regulation 2015/2283 of 25/11/2015, which defines 'novel food' as any food that was not used for human consumption to a significant degree within the Union before 15 May 1997, irrespective of the dates of accession of Member States to the Union.

Jellyfish in particular, being a traditional dish in China and in most Southeast Asian Countries, are designated as "novel foods in EU coming from traditional foods in a third Country", that derive from primary production and with a history of safe food use in a third Country.

The "novel foods" or new food ingredients must be, like all foods, safe for public health. Therefore, they require a food safety assessment and must be authorized or notified to the European Commission before they can be placed on the EU market.

We highlight that the food use of jellyfish is not yet authorized in Italy and in the whole Europe at the time of publication of this book. An application for authorization or notification to European Commission is needed.

The EU regulation on novel foods includes specific rules and requires an application for authorization or notification to the European Commission, for the placing of a traditional food from a third Country on the EU market.

After the evaluation of the application by the Commission and the favorable opinion of the EFSA (European Food Safety Authority), jellyfish can be marketed and consumed as food or food ingredients.

The placing on the market within the European Union of traditional foods from third Countries should be facilitated where the history of safe food use in a third Country has been demonstrated.

The definition of "history of safe use as food" indicates foods consumed for at least 25 years, as part of the customary diet of a significant number of people in at least one third Country.

As regards jellyfish as traditional foods from Third Countries having a history of safe food use, the applicants should be able to opt for a faster and simplified procedure to update the European Union food list, if no duly reasoned safety objections are further expressed.

Food-borne diseases, zoonoses, and jellyfish

In Europe there is still no food production chain for jellyfish, but the European regulations on food safety are very robust, just respect them!

The risk of food contamination is always present from farm to the table, therefore prevention and control measures along the whole food chain are required. In modern food production processes, a risk assessment strategy is applied and supply chains are monitored and controlled at different critical points.

In addition, some human diseases originate from animal infections, called zoonoses, which can involve various agents such as bacteria, fungi, viruses, prions and protists. Several of such diseases can be transmitted to humans through contaminated food and sometimes by contact with the live or slaughtered animals (food-borne zoonoses). Specific measures against zoonoses are included in the Veterinary Public Health EU legislation.

Handle, cook, and store jellyfish as well as the other foods, properly!

European regulations about food hygiene establish very restrictive requirements for food producers and operators, providing standards for official food controls and regulating the monitoring and control of food-borne diseases.

Scientific opinions of the experts allow to continuously review the current legislation, in order to reduce the incidence of known food-borne diseases and to communicate data relating to the main zoonoses as well as to the less common or emerging ones.

The globalization of the food markets and the emergence of "novel foods" requires harmonized and globally extended risk assessment practices across different Countries.

The World Health Organization has made several general recommendations to reduce the risk of transmission of emerging pathogens from animals to humans, in live animal markets. **Most of the recommendations are related with good practices relating to live animal markets, wet markets or animal product market.** Therefore, the putative future jellyfish market must comply with these rules.

Jellyfish and fisheries diversification

The sea impoverishment, fish species on the verge of extinction, non-native species invasion, the concerns about the future of small-scale fishers, force us to reflect on our food consumption models, just as SlowFish - the fishing section of SlowFood - has been doing for a long time. If fishing, marketing and food use of jellyfish from the European seas will be possible, a new fish supply chain could arise also in Europe. Local fishermen, especially those who practice artisanal fishing, would have the possibility of using unconventional marine species, such as jellyfish, which are often the object of accidental fishing or bycatch, as a new source of livelihood.



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Literature

- Bleve G, Ramires FA, Gallo A, Leone A (2019) Identification of safety and quality parameters for preparation of jellyfish based novel food products. *Foods* 8(7):263
- Commissione delle Comunità europee, Libro bianco sulla sicurezza alimentare, Bruxelles, 12.1.2000, COM (1999) 719 (http://www.salute.gov.it/imgs/C_17_pubblicazioni_1553_allegato.pdf)
- Leone A., Lecci, Milisenda, Piraino. 2019 Mediterranean jellyfish as novel food: effects of thermal processing on antioxidant, phenolic, and protein contents. *European Food Research and Technology*. <https://doi.org/10.1007/s00217-019-03248-6>
- Leone A, Lecci RM, Durante M, Meli F, Piraino S (2015) The bright side of gelatinous blooms: Nutraceutical value and antioxidant properties of three Mediterranean jellyfish (Scyphozoa). *Mar Drugs* 13:4654–4681.
- Leone A, Lecci RM, Durante M, Piraino S (2013) Extract from the zooxanthellate jellyfish *Cotylorhiza tuberculata* modulates gap junction intercellular communication in human cell cultures. *Mar Drugs* 11:1728–1762.
- De Domenico S, De Rinaldis G, Paulmery M, Piraino S, Leone A (2019) Barrel Jellyfish (*Rhizostoma pulmo*) as source of antioxidant peptides. *Mar Drugs* 17 (2): 134.
- FAO (2018) *The State of World Fisheries and Aquaculture*. Rome.
- FAO (2020) *The State of World Fisheries and Aquaculture 2020. Sustainability in action*. Rome.
- Torri L, Tuccillo F, Bonelli S, Piraino S, Leone A (2020) The attitudes of Italian consumers towards jellyfish as novel food. *Food Qual Prefer* 79:103782.
- Regulation (EU) 2015/2283 of the European Parliament and of the Council of 25 November 2015 on novel foods, amending Regulation (EU) No 1169/2011 of the European Parliament and of the Council and repealing Regulation (EC) No 258/97 of the European Parliament and of the Council and Commission Regulation (EC) No 1852/2001 (<http://eur-lex.europa.eu/eli/reg/2015/2283/oj>)
- Directiva 2003/99/EC sulle misure di sorveglianza delle zoonosi e degli agenti zoonotici (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02003L0099-20130701>)
- EFSA 2008. Safety of aluminium from dietary intake. *The EFSA Journal* (2008) 754, 1-34 (<https://www.efsa.europa.eu/en/efsajournal/pub/754>)
- EFSA 2012. Technical specifications for the harmonised monitoring and reporting of antimicrobial resistance in MRSA in food producing animals and food. *EFSA Journal* 2012;10(10):2897, 56pp. <https://doi.org/10.2903/j.efsa.2012.2897>
- EFSA 2018. Plain language summary: The European Union One Health 2018 Zoonoses Report (https://www.efsa.europa.eu/sites/default/files/corporate_publications/files/5926-pls-zoonoses-report-2018.pdf)
- <http://www.slowfood.com/slowfish/>



Jellyfish: a sustainable seafood?

Jellyfish are on the increase on all oceans and seas. Fish populations are overexploited and, since nature abhors void, the space of the fish is taken by other animals, and jellyfish are among them.

In the eastern world jellyfish are a delicacy and they might be a "novel food" also in the west. Shall we eat jellyfish? If this is going to happen, we must be certain that the inclusion of jellyfish in our diet is sustainable and conscientious.

Ferdinando Boero
Professor of Zoology,
University of Naples "Federico II", Italy



Gennaro Esposito

Vico Equense, Salerno, Italy

Michelin star chef, celebrity on culinary TV programs, supporter of territorial cuisine

The biography of Gennaro Esposito could be synthesized in a sentence: "In my profession, forgetting one's origins is a mortal sin, a gesture of arrogance that also precludes the possibility of future discoveries". Gennaro is an appreciated two-star Michelin chef and his restaurant - the Torre del Saracino - is a reference point for Italian cuisine since 1991.

Gennaro Esposito offers a cuisine that respects and enhances his territory but which is also the result of the experiences gained during internships and travel around the world. Trained at the association of Jeunes Restaurateurs of Europe (JRE), in 2001 he obtained the first Michelin star followed by the "Three Forks" of the *Gambero Rosso* in 2003, in 2008 the second Michelin star, in 2011 he obtained the title of "Best Italian Chef of the year" for *Identità Golose*. Torre del Saracino restaurant is also present in the guides "Le Soste" and "Les Grandes Tables du Monde".

Member of the educational council of the Gastronomic University of Southern Italy, he received the "Chef Mentor 2020" award from Michelin because he is universally recognized as a safe and prolific guide for young chefs.

Gennaro, as a mindful professional, often anticipates the evolution of culinary world by measuring himself also at international level. He inaugurated the restaurant IT in Ibiza in 2015, followed by IT Milan and IT London. He is currently the protagonist of television broadcasts such as "*Cuochi d'Italia*", judge for "Masterchef Junior" and other TV programs.

Excellent results were produced by his attempt to export his philosophy and territory by relating these elements to the modern cuisine of the coolest places in Europe.

The inspiring beacon of Esposito always remains the creativity, combined with the care of raw materials and seasonality, especially those related to its territory. And this is why he approaches first and with enthusiasm the experimentation of jellyfish as a new food - local and sustainable - by presenting at the Slow Fish Festival in 2013 his recipe "Pelagia carpaccio", which is proposed in this cookbook.

Jellyfish in Carpaccio

Dish type: Starter

Preparation time: About 90 minute

Serving: 4 servings

Ingredients

To make marinade for jellyfish

- 4 little jellyfish *Pelagia noctiluca* (Forsskål 1775) or *Cotylorhiza tuberculata* (Macrì 1778)
- 70 g salt
- 70 g sugar

To make marinade for zucchini

- 1 large zucchini
- 1 kombu seaweed of about 5 cm
- 2 g salt

Zucchini flower pesto

- 30 zucchini flowers
- 20 zasil leaves
- 2 spoons of pine nuts
- 2 spoons of extra virgin olive oil
- salt to taste

**Trifolium pratensis* L., 1753.

Vegetable smoothies

- 120 g stems of clover*
- 4 beetroot leaves with stem

NUTRITION FACTS (100 g)		%DV *
Energy	203.9 kJ / 48.7 kcal	2%
Total Fat	4.5 g	6%
of which: Saturated Fat	0.6 g	3%
Monounsaturated Fat	2.9 g	
Polyunsaturated Fat	0.7 g	
Cholesterol	0 mg	0%
Total Carbohydrate	0.7 g	0%
of which: Sugars	0.5 g	1%
Dietary Fibre	0.4 g	2%
Protein	1.1 g	2%
Salt	0.03 g	1%
Calcium	9.6 mg	1%
Magnesium	11.5 mg	4%
Potassium	90.4 mg	53%
Sodium	11.3 mg	1%

(*)DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- Clean the jellyfish by removing oral arms and tentacles, rinse with tap water to eliminate cnidocytes* and any toxins.
- Marinate the jellyfish with 70 g of salt and 70 g of sugar for about 5 minutes, rinse with tap water to remove the salt and sugar, dry and keep aside. Cut it in julienne strips.
- Prepare the zucchini flower pesto emulsifying zucchini flowers (without stems) and basil (previously blanched quickly in boiling water and cooled in water and ice), with pine nuts, olive oil, and salt.
- Centrifuge the clover stems and keep the juice.
- Cut kombu seaweed and zucchini in julienne strips (only the outer part), and leave everything to marinate for 10 minutes with 2 g of salt.
- Wash and dry beetroot leaves including their stems and keep aside.

Plate presentation

Place the juice on the bottom of the plate. Lay on the plate some beetroot leaves on one side and then in sequence the marinated zucchini with the kombu seaweeds, the zucchini flower pesto and the julienne-cut jellyfish at the end. Complete with a drizzle of raw extra virgin olive oil.

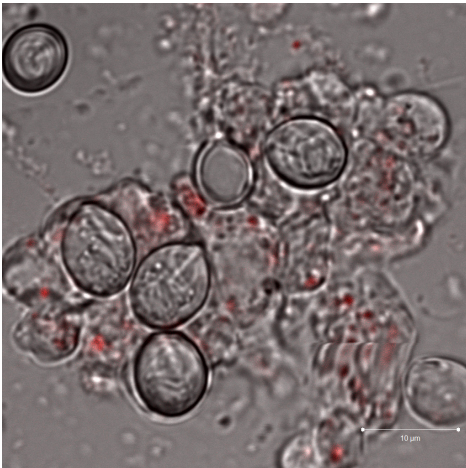
**Cnidarians contain specialized cells known as cnidocytes ("stinging cells"), which contain organelles called cnidocysts (stingers).*

Cnidocytes: the defence of spineless jelly organisms

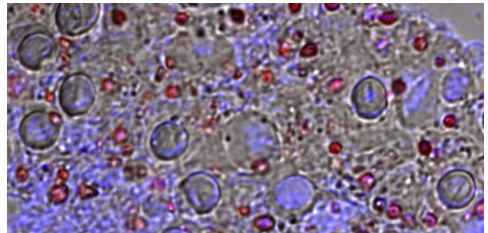
Cnidarians, the phylum to which jellyfish belong, are characterized in their epithelia by highly specialized cells, the **cnidocytes**. These cells are used as defense or to immobilize the prey with the toxins contained within the cells. Each cnidocyte contains a single, intracellular stinging organelle, the **cnidocyst**. This is made by an ovoid capsule covering a coiled filament armed with spines. Upon contact with a prey, each elicited cnidocyte fires its filament outward which penetrates and injects paralyzing toxins in the prey.

Sometimes they could be very stinging and sometimes dangerous also for humans. Processing of jellyfish for food uses must address this issue by allowing the discharge of cnidocysts or neutralizing the effect of the toxins.

Washes and treatments to which edible jellyfish are subjected are able to eliminate or make harmless these cells before jellyfish consumption as food.



Cnidocytes containing cnidocysts. They are specialized cells for predation and defense scattered on the jellyfish body surface around the mouth and on tentacles, serving to immobilize prey with toxins contained within the cells.





Fabiano Viva

Lecce, Italy

From journalism to cooking, a passion story

Fabiano Viva comes to the profession of chef after a long experience as a sports journalist and radio commentator that gives him a flair that he invests totally in culinary creativity.

Fabiano's cuisine focuses on the extreme quality of raw materials and the elegance of the dish presentation, passing through experimentation and modern techniques. The result is experiential dishes that reinterpret the traditional flavors.

He met Antonella Leone and Stefano Piraino by chance and he was immediately enthusiastic about the idea of using jellyfish as a new food raw material. Fabiano, together with his staff, studies the structure, shape and above all the smell and taste of fresh jellyfish "They are not so different from other edible marine organisms," he says. From here, it was not difficult for a creative chef like Fabiano Viva to reach some truly singular culinary interpretations of jellyfish, only a few are presented in this cookbook.

"As for all the ingredients, the same rules apply to jellyfish: the profound knowledge of the raw material, what it can express in the various types of cooking and how it can be combined with other ingredients to create that harmony of flavors that enhances the good characteristics and mitigates the less good ones ... as well as a good dose of curiosity, imagination and joie de vivre".

Fabiano Viva is actively collaborating with the CNR-ISPA to the dissemination activities for the GoJelly project, participating to documentaries on national and international media.

Jellyfish and Caviars

Dish type: Appetizer

Preparation time: about 60 min + 12 hours for the false caviar solutions

Serving: 1-2 servings

Ingredients

- 500 - 600 g jellyfish (*Rhizostoma pulmo*, Macrì 1778)
- parsley to taste
- Campari bitter to taste
- gin to taste
- carrots to taste
- celery to taste
- white sturgeon caviar (Beluga type)

For spherification

Calcium Spherification Bath

- 1 liter of water
- 6,5 g Calcic (calcium chloride E509, potassium chloride E510)

Alginate Spherification Bath

- 1 liter of water
- 8 g sodium alginate (E 401)
- salt to taste

NUTRITION FATCS (100 g)		%DV *
Energy	523.2 kJ / 125 kcal	6%
Total Fat	12.2 g	17%
of which: Saturated Fat	1.8 g	9%
Monounsaturated Fat	1 g	
Polyunsaturated Fat	8.75 g	
Cholesterol	0 mg	0%
Total Carbohydrate	1.8 g	1%
of which: Sugars	<0.1 g	0%
Dietary Fibre	1.4 g	6%
Protein	1.3 g	3%
Salt	4.3 g	72%
Calcium	78 mg	10%
Magnesium	341.8 mg	114%
Potassium	533.8 mg	314%
Sodium	1,735 mg	87%

(*DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

For preparation of false caviars of parsley, Campari, gin, carrots e celery

- Mix calcium and potassium salts in 1 litre of water to obtain a calcium spherification bath. Leave in the fridge at 4 °C, for 12 hours.
- Mix sodium alginate in 1 litre of water to obtain an alginate spherification bath. Leave in the fridge for 12 hours.
- Parboil the parsley for a minute at most, and preferably in a *court-bouillon*, drain it, put it in water and ice to preserve the chlorophyll and keep it aside. Then, by a juice extractor, extract the carrot and celery juices and let them stay in the fridge for at least an hour.
- For spherification of the liquids, mix 2/3 of the alginate bath and 1/3 of the liquid you want to use for make caviar-like spheres (gin or Campari or each vegetable liquid) and proceed to spherification to obtain different types of false caviars.
- Drop slowly each mix into the calcium bath, with the aid of a syringe. Remove from the bath the obtained spheres and wash them with fresh water. Keep them aside.

Jellyfish preparation

- Remove the oral arms from the jellyfish and cook the umbrella under vacuum, as reported in pag. 25, leave it in the water and ice.

Plate presentation

Place in a flat plate the fresh seasoned salad leaves and carefully lay the whole cooked jellyfish umbrella with the concavity at the top, like a little bowl. Fill it with the caviars like spheres of parsley, Campari, gin, carrot and celery. Sprinkle everything with white sturgeon caviar.

The chef recommends Beluga-like caviar, choosing the sustainable one, that would make the dish much tastier and more refined.

Spherification, a modern cuisine technique

Direct spherification is a way to create small, caviar-sized spheres that pop in the mouth with an intense burst of flavor. They are whimsical and fun. The technique is recent, it was pioneered by Ferran Adrià at el Bulli in 2003, it is applicable to a wide range of juices to give them the appearance and texture of caviar.

The related techniques of reverse and basic spherification were developed in the following years. All of these methods are based on the jellification of alginate in contact with calcium ions. In direct spherification, alginate is added directly to the liquid you want to make caviar-like. This solution is then added drop by drop to a setting bath containing calcium. While calcium ions interact with the alginate, a flexible skin is formed around the drop. The concept is simple, but there is an art to achieve good results with this technique.



Jellyfish and Cuttlefish “Tagliatelle”

Dish type: Starter

Preparation time: About 60 minute

Serving: 1-2 servings

Ingredients

- 1 kg of jellyfish (*Rhizostoma pulmo*, Macrè 1778)
- 1 kg cuttlefish

For court-bouillon

- 2 liter of water
- 1 liter of dry white wine
- pepper in grains
- fresh thyme
- parsley
- white celery stems
- white onion roasted in half
- garlic if you like

NUTRITION FACTS (100 g)		%DV *
Energy	197.2 kJ / 47.1 kcal	2%
Total Fat	2.1 g	3%
of which: Saturated Fat	0.3 g	2%
Monounsaturated Fat	1.2 g	
Polyunsaturated Fat	0.2 g	
Cholesterol	20.2 mg	7%
Total Carbohydrate	1.3 g	1%
of which: Sugars	1.1 g	1%
Dietary Fibre	0.5 g	2%
Protein	5.5 g	11%
Salt	3.3 g	55%
Calcium	57.1 mg	7%
Magnesium	239.2 mg	80%
Potassium	397.9 mg	234%
Sodium	1,320 mg	66%

(*DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- Prepare a *court-bouillon* with the listed ingredients.
- Clean the cuttlefish from the entrails, remove cuttlebone, head, tentacles and the skin. Cook the cuttlefish mantle over a very low heat in the *court-bouillon* until it is cooked (about 35-40 minutes) and let it cool.
- Roll the cuttlefish mantle into a very tight spiral, and wrap it in food plastic wrap, and place it in the blast chiller at -24 °C, until it is stiffened but not completely frozen.
- Free the cuttlefish from the food plastic wrap, and cut it into thin slices using a slicer to obtain strips similar to noodles (tagliatelle).
- Remove the oral arms from jellyfish and cook the umbrella under vacuum, at 93 °C as described in the dedicated section, leave aside on ice. Apply the same operation made for cuttlefish to the jellyfish umbrella.
- Two types of strips with slightly different colours and textures will be obtained, the cuttlefish will be whiter and opaquer and the jellyfish more bluish and diaphanous which will resemble a light blue opaque glass.
- Mix the two types of "tagliatelle" and season with salt, pepper, extra virgin olive oil, lemon juice, parsley and carrot julienne.

Plate presentation

Put the mix of "tagliatelle" on the centre of a flat plate as a nest. If you like, it is possible to add again celery at julienne, lemon zest, fresh thyme and green and red shiso sprouts. Serve as a plate of "tagliatelle" pasta.

Vacuum cooking

In vacuum cooking, foods are cooked at reduced pressure and temperature. In one vacuum technique, known as *sous-vide* cooking, foods are cooked in their own juices, thus retaining their natural flavours and moisture. Cooking time is usually increased because of the low temperatures employed.

The process is proved useful for jellyfish due to their high-water-content and tendency to lose fluids. At the end, jellyfish should have lost about 70% of its weight and as result you will have a stable gelatinous mass, but of a significantly reduced size.

You need:

- thermostatic bath/steam oven
- vacuum plastic bag for food
- jellyfish (better the umbrella)

Procedure:

- Set the thermostatic bath or the steam oven temperature at 93 °C.
- Seal the vacuum bag containing the jellyfish umbrella; add a spoon of extra virgin olive oil if you want to cook by low-temperature steaming with olive oil.
- Cook for about 5-10 minutes for each kg of jellyfish weight.
- Put the bag into iced water.
- Remove the cooked jellyfish from the bag, throwing away the excess liquid, and rinse it in water and ice.

Jellyfish Mediterranean Soup

in smoked fish broth, kombu and tuna *bottarga*

Dish type: Main course

Preparation time: About 60 minute

Serving: 1-2 servings

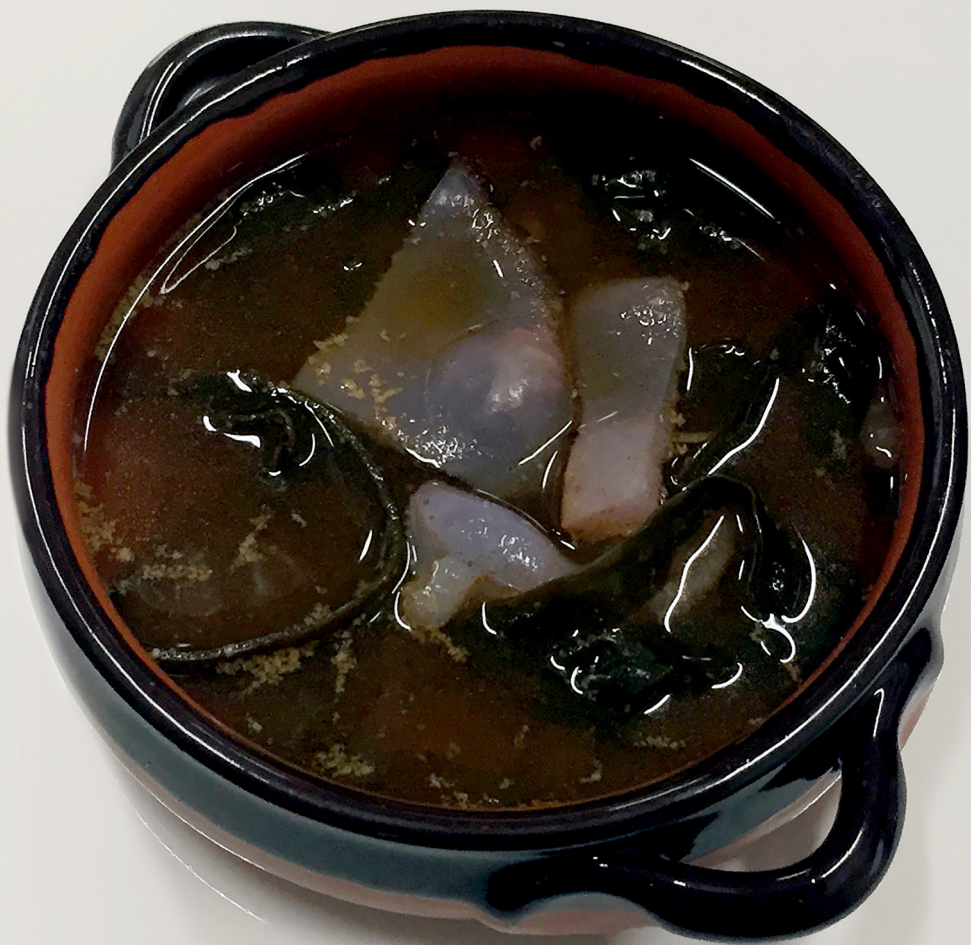
Ingredients

- tentacles and umbrellas of two large raw jellyfish (*Rhizostoma pulmo*, Macrì 1778)*
- smoked fish broth
- tomato sauce
- desalted fresh kombu cut into strips
- tuna roe ("bottarga")

NUTRITION FACTS (100 g)		%DV *
Energy	100.5 kJ / 24 kcal	1%
Total Fat	1 g	1%
of which: Saturated Fat	0.3 g	2%
Monounsaturated Fat	0.2 g	
Polyunsaturated Fat	0.4 g	
Cholesterol	8.8 mg	3%
Total Carbohydrate	0.8 g	0%
of which: Sugars	<0.1 g	0%
Dietary Fibre	0.1 g	0%
Protein	2.9 g	6%
Salt	3 g	50%
Calcium	68.3 mg	9%
Magnesium	189.3 mg	63%
Potassium	276.1 mg	162%
Sodium	1,216 mg	61%

*This dish is suitable for recovering the jellyfish oral arms not used in the appetizer and starter recipes.

(*)DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- Smoke some fish carcasses without entrails, gills, and eyes with shavings of soft wood and use them to prepare a smoked fish broth. Filter with etamine.
- Heat the broth until boiling with a spoonful of tomato sauce per person.
- Dip the seaweed in the broth and cook for 20 minutes, then add jellyfish tentacles and umbrella in pieces. Complete cooking for as long as necessary (about 10 min).

Plate presentation

Pour the still steaming jellyfish soup in a bowl and grate abundant tuna bottarga on it. Serve advising to mix before tasting.

Tasting notes

The Asian-looking dish amazes with its distinctly Mediterranean aroma and taste given by the tuna bottarga and the smoked fish. The tactile sensations of jellyfish surprise with their pleasant consistency and the ability of jellyfish tissues to adsorb flavours.

Marine protein resource. Quality not quantity!

The calorie intake of edible jellyfish is very low! In fact, jellyfish consist of 95-97% of water and salts, 3-5% of proteins, and contain very little fat except for the valuable omega-3 and omega-6 fatty acids provided by the symbiont microalgae that are hosted in some jellyfish species.

Bioactive compounds with high antioxidant activity are present in numerous species. Natural jellyfish are also a good source of **magnesium and potassium**, while jellyfish treated with the traditional Chinese method have an excess of salt (sodium chloride).

They might seem like a rather poor protein source, however jellyfish proteins, and especially **collagen**, provide **bioactive peptides** with **antioxidant** and **anti-inflammatory activity** and potential health benefits!

In the photo: *Cotylorhiza tuberculata*, Macri 1778





Kit Mak

Hong Kong, Cina

Culinary celebrity, recipe designer, food stylist and food video director

Ms Mak was graduated in Hong Kong Polytechnic University with BA (Hon) in Hotel and Catering Management.

Her remarkable aesthetic sense in food styling and the quality of her recipes granted her the appearance as judge in the famous TV cooking program "Beautiful Cooking".

Having 15 years' experience in recipe writing and food styling, Ms Mak is the cooking specialist within The Hong Kong Council for Accreditation of Academic and Vocational Qualifications. Moreover, she has also been invited by the Hong Kong Tourism Board to be on the jury of the Best of the Best Culinary Awards and a member of The Food Truck Pilot Scheme committee in the past years.

Ms Mak is now focusing on brand endorsement, food consultancy, food styling for photo shooting, directing and producing cooking video.

Ms Mak visited CNR-ISPA in Lecce (Italy) with the TV of Hong Kong (HKTV) for a documentary on the research studies of CNR-ISPA on jellyfish as food, she honoured the Italian chef Fabiano Viva of her presence.

Jellyfish with Noodles and Sesame sauce

Dish type: Main course

Preparation time: About 40 minute

Serving: 2 servings

Ingredients

- 4 packs of *ready-to-eat* jellyfish* (around 500 g in total)
- 2 portions Japanese/ Korean *udon* or *noodle* (dried/frozen)
- 2 small cucumbers finely sliced

Sauce

- 4 tablespoons of sesame paste / peanut butter
- 3 tablespoons of white vinegar / apple cider vinegar
- 3-4 tablespoons of light soy sauce
- 2 spoons of sugar
- a pinch of salt

NUTRITION FATCS (100 g)		%DV *
Energy	673.5 kJ / 160.9 kcal	8%
Total Fat	6.7 g	10%
of which: Saturated Fat	1 g	5%
Monounsaturated Fat	2.2 g	
Polyunsaturated Fat	2.7 g	
Cholesterol	2.3 mg	1%
Total Carbohydrate	17.5 g	7%
of which: Sugars	3.2 g	1%
Dietary Fibre	1.1 g	4%
Protein	7.1 g	14%
Salt	11.9 g	198%
Calcium	49.4 mg	6%
Magnesium	14.5 mg	5%
Potassium	75.9 mg	45%
Sodium	4,773 mg	239%

*Ready to eat jellyfish are Asiatic commercial products prepared by the traditional process using the salt and alum brining and usually sold in ready-to-use packages that also include seasonings

(*)DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- Remove the jellyfish from the package. Wash it with running cold water. Bring a pot of water to the boil. Quickly put the jellyfish in the boiling water for 2-3 seconds. Quickly drain well and soak into ice and water. When the jellyfish is completely cooled down, drain it thoroughly. This procedure is to keep the texture crunchy.
- Mix together the sauce ingredients until a smooth dough is obtained.
- Bring a pot of water to the boil. Put the *udon/noodle* into the boiling water and cook for 4 minutes. Drain well. Set aside.
- Mix the jellyfish with the sauce.

Plate presentation

Place the *udon/noodles* into the bowl. Add jellyfish sauce on the top and decorate with cucumber slices. Mix well before serving.

Cooking tips from Kit Mak

There are 2 kinds of jellyfish at the super market or in China Town. One is packaged and ready to eat. The other one is semi dried and marinated in heavy salt. If you choose to use the semi dried one, wash it thoroughly and soak it in water for 2 days in the fridge. Change water a few times to remove salt and sands. Follow the instructions above (cook in boiling water for 2-3 seconds, drain well and soak in ice water immediately. Drain well before use). For the beginners, the packaged jellyfish is easier to handle.

Jellyfish in the Chinese culinary tradition

Edible jellyfish are mainly consumed and marketed in Southeast Asian Countries, such as Japan, China, Korea, Thailand. After fishing, they are treated by a multi-phase drying process, using mixtures of salt and alum, and they are sold in local markets as dried, semi-dried or marinated products. There is also a multimillion dollar export business. In the East it is a particularly delicious dish while in Europe the use of jellyfish as food is not yet widespread; however, the globalization of the markets and the availability of raw materials could make this possibility more and more real.

Asiatic vs European: the alum makes the difference!

Traditional Asiatic processing methods involve a multi-phase procedure using a mixture of salt (NaCl) and a mixed salt of aluminum and potassium of sulfuric acid, known as **alum** (Al K [SO₄]₂•12 H₂O) as stabilizing agent to reduce the water content, decrease the pH, and firm the texture.

Processed jellyfish have a special crunchy and crispy texture, which Asiatic people love.

Jellyfish are then desalted in water before preparing for consumption, but most alum can remain in food! Aluminum from dietary sources can accumulate in the body and produce negative health effects.

Europe regulation allows a maximum weekly intake of aluminum of 1mg of Al / kg of body weight per week. This value can be easily exceeded by consuming jellyfish products obtained with the traditional Chinese method.

So, we need a new alum-free process!

Requests for an Italian patent (No. 102019000011472 of 11/07/2019) and its extension to European patent (No. EP20185250.6 of 10/07/2020), authored by CNR-ISPRA and related to an alum-free processing of jellyfish for food uses, were submitted to the Italian Ministry of Economic Development and the European Patent Office, respectively.

“Lo Hei” with Jellyfish

Cantonese style salad with jellyfish

Dish type: Side dish

Preparation time: About 60 minute

Serving: 2 servings

Ingredients

- 250 g turnip
- 180 g carrot
- 80 g cucumber
- 100 g beet root/cooked beetroot
- 50 g pickled leek /onion
- 2 packs *ready-to-eat* jellyfish (around 300 g in total)
- 6-8 fresh lime leaves
- 4-5 tablespoons roast peanut

Sauce

- 150 g chinese plum sauce/fig jam
- 2 tablespoons Thai/Korean fish sauce

NUTRITION FACTS (100 g)		%DV *
Energy	429.1 kJ / 102.5 kcal	5%
Total Fat	3.5 g	5%
of which: Saturated Fat	0.5 g	3%
Monounsaturated Fat	1.4 g	
Polyunsaturated Fat	1 g	
Cholesterol	1.5 mg	1%
Total Carbohydrate	12.4 g	5%
of which: Sugars	11.3 g	1%
Dietary Fibre	2.5 g	10%
Protein	4.1 g	8%
Salt	7.4 g	123%
Calcium	28.4 mg	4%
Magnesium	19.7 mg	7%
Potassium	184.2 mg	108%
Sodium	2,969 mg	148%

(*)DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- Remove the jellyfish from the package. Wash it with running cold water. Bring a pot of water to the boil. Quickly put the jellyfish in the boiling water for 2-3 seconds. Quickly drain well and soak into ice and water. When the jellyfish is completely cooled down, drain it thoroughly. This procedure is to keep the texture crunchy.
- Peel the skin of turnip, carrots and beet root. Cut the turnip, carrots, beet root and pickled leek/onion into thin slices. Mixed them with a pinch of salt except pickled leek/onion. Squeeze out the extra juice of turnip.
- Remove the seeds from the cucumbers. Cut into thin slices and squeeze the extra juice out.
- Crumble the roasted peanuts. Mix the Chinese plum sauce/fig jam and Thai fish sauce together.
- Remove the stem from lime leaves. Cut the leaves into thin slices.

Plate presentation

Place all the slices of vegetables in separate stacks in a salad bowl or in a plate. Place the jellyfish in the center and pour the sauce on all the salad ingredients. Sprinkle with the roasted and crumbled peanuts and lime leaves. Mix well when serving.

Notes from Kit Mak

What does "Lo Hei" mean? It is a Cantonese word spread from Malaysia Cantonese people. "Lo" means "you have a good job to do". It also means "mixing". "Hei" means "Happiness" and "Good Prospect". "Lo Hei" together means you have a career with good prospects and development. Therefore, every Chinese New Year, the Malaysian Cantonese people will have such kind of dish to have good luck and wealth in the coming year. Each of them will hold a pair of chopsticks,

gather around the dish and mixing the salad together using their chopsticks on hand, keep saying "Lo Hei. Lo Hei". Traditionally, Malaysian Cantonese will add raw salmon fillet in this dish. I found that it is much more delicious when adding jellyfish instead. **In this photo it is prepared with both Asian and Mediterranean style jellyfish.** It is a very refreshing salad mixing with a very special dressing called Plum Sauce. This Plum Sauce is very good for Cantonese Roast Duck. If you cannot find it, let replace it with fig jam, apricot jam or another marmalade. The most important thing is adding the Lime leaves slices. It gives a totally different taste for the dish. Enjoy!





Pasquale Palamaro

Ischia, Naples, Italy

Starry chef, energetic and passionate about the resources of the sea

Chef Pasquale Palamaro was born in the splendid island of Ischia in 1978, all his activity expresses the passion for his work that seems to confirm the proverb «if you love your work, you will never work».

His career at Albergo della Regina Isabella is studded with various collaborations with famous chefs from the Italian and international culinary scene, and numerous starred chefs. His training enrichment continues alongside chefs representing excellence on the national and international scene. For Chef Palamaro's career, 2013 represents a milestone, he is, in fact, awarded the coveted Michelin star, thanks to his work in Indaco, the restaurant of the Albergo della Regina Isabella for which he is Executive Chef.

These rewarding experiences have stimulated Pasquale even more, making him dedicate, with tenacity and energy, with heart and soul, to the search for new techniques and raw materials, which would allow him to better express the flavours and colours of his land and especially of his sea. A continuous exchange that leads Pasquale Palamaro to make his cuisine, mainly seafaring, increasingly identifiable of a territory rich in resources, as is the south of Italy. He pays particular attention to the presentation of the dishes, in order to enhance the food to both look and palate.

His passion for the sea and sea resources led him to collaborate with various marine biology centres, such as the Zoological Station of Naples, the University of Salento and the CNR-ISPAs of Lecce, which he reached from his Ischia with the firm intention to experiment jellyfish, those of its sea, the Tyrrhenian Sea, as a new culinary challenge.

Purple and Gold Marinated Jellyfish

Pelagia marinated in lime and grapefruit juice, quinoa, tomato oil and purslane

Dish type: Starter

Preparation time: About 6 hour

Serving: 2 servings

Ingredients

- 4 big jellyfish (*Pelagia noctiluca*, Forsskål 1775)
- 100 gr yellow quinoa
- salt and pepper to taste
- 4 tufts of purslanes*
- 4 tufts of wild fennel beard**
- 2 edible flowers

Tomato oil

- 100 ml extra virgin olive oil
- 10 gr tomato paste

For the first marinade

- 1 litre of water
- 10 g edible lime (calcium hydroxide)

Portulaca oleracea*, L. ; *Foeniculum vulgare*, Mill.

For the second marinade

- 100 ml lime juice
- 100 ml grapefruit juice
- 100 ml carbonated water
- 2 g salt
- 1 g sugar
- 1 lime peel
- 2 fresh basil leaves

NUTRITION FACTS (100 g)		%DV*
Energy	1,759 kJ / 420.4 kcal	21%
Total Fat	33.2 g	47%
of which: Saturated Fat	4.5 g	23%
Monounsaturated Fat	22.8 g	
Polyunsaturated Fat	2.4 g	
Cholesterol	0 mg	0%
Total Carbohydrate	24.5 g	9%
of which: Sugars	0.8 g	1%
Dietary Fibre	2.2 g	9%
Protein	4.8 g	10%
Salt	0.9 g	15%
Calcium	12.7 mg	2%
Magnesium	43.7 mg	15%
Potassium	138.8 mg	82%
Sodium	363.5 mg	18%

(*)DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1159/2011).





Preparation

- Separate the jellyfish tentacles from the umbrella using scissors and gloves. For the first marinade, leave for 1 hour in water and lime certified for food use. Rinse under running water and then blanch for 1 minute the jellyfish and tentacles in boiling salted water. Cool immediately in ice and water, and keep aside.
- For the second marinade, add the juice of lime and grapefruit, the carbonated water, the salt, the sugar, the peel of lime and grapefruit and the fresh basil leaves in a bowl and lay the jellyfish tentacles, leaving to marinate in the fridge, at 4 °C for 4 hours. Remove the jellyfish from the marinade and set aside.
- Emulsify the extra virgin olive oil and the tomato paste in a blender at medium speed for 5 minutes and set aside.
- Soak the yellow quinoa for 5 hours by changing the water 3 times. Then boil in plenty of salted water. When cooked, drain and season with salt, tomato oil and pepper.
- Thoroughly wash all herbs and set aside.

Plate presentation

Place the quinoa in the centre of the plate, lay the jellyfish cut in half, season with the tomato oil and complete the plate with the freshly washed herbs and flowers. The chef recommends to consume warm.

In the photo: *Pelagia noctiluca*, Forsskål 1775



Giovanni Ingletti

Tricase Porto, Lecce, Italy

Chef according to the whims of the Salento seaside

Giovanni Ingletti is a young Salento chef, he got the high school diploma from a catering and hotel management school in Santa Cesarea Terme, where he also had his first experience as chef, followed by work experience on the Swiss mountains in Villars-sur-Ollon. Then he returned home, to the Taverna del Porto, a typical restaurant where he is currently Executive Chef.

Giovanni is deeply linked to his land, the Salento peninsula, whose coasts overlook the southernmost part of the Adriatic sea, pointing to the heart of the Mediterranean Sea, the cradle of Western civilizations. Giovanni reciprocates this privilege by engaging himself, with competence and seriousness, in a seafood cuisine that is declined according to the unpredictability of the sea. The use and valorization of raw food materials, both land and sea, are closely linked to the territory. This represents a challenge for the preparation of dishes in which the territorial traits are always recognizable but in which care, quality and freshness of the ingredients, make them a full and precise taste experience.

Giovanni Ingletti and the patron Alessandro Coppola accepted the challenge of using jellyfish, at the end a local product, as the basis for new dishes, in which the local trait, however, is not lost but found in a new harmony of flavors.

Fried Jellyfish Pizzaiola-like

Dish type: Starter/Appetizer

Preparation time: About 60 minutes + 24 hours

Serving: 2 servings

Ingredients

- 1 big jellyfish (*Rhizostoma pulmo*, Macrì 1778)
- 500 g "datterini" (cherry) tomatoes
- 1 shallot
- 1 fresh hot pepper
- 1 bunch of basil
- 5 pieces capers
- 200 g "00" type flour
- 120 g water
- extra virgin olive oil
- salt to taste
- oregano to taste
- dehydrated olives

NUTRITION FACTS (100 g)		%DV *
Energy	763 kJ / 182 kcal	9%
Total Fat	16.2 g	23%
of which: Saturated Fat	2.8 g	14%
Monounsaturated Fat	7.2 g	
Polyunsaturated Fat	3.5 g	
Cholesterol	8 mg	3%
Total Carbohydrate	8.3 g	3%
of which: Sugars	0.5 g	1%
Dietary Fibre	0.8 g	3%
Protein	0.4 g	1%
Salt	4.2 g	70%
Calcium	62.2 mg	8%
Magnesium	316.7 mg	106%
Potassium	470 mg	276%
Sodium	1,619 mg	81%

(*DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- Wash the tomatoes under running water, cut in half and place them in a bowl with oregano, salt, chilli pepper and oil and leave to macerate for 24 hours in the refrigerator.
- When the marinating time is over, pass the tomatoes by a grinder, and then pass the mixture through a sieve.
- Wash the jellyfish under tap water and cook it in a plenty boiling water for about 5 minutes.
- After cooking, cool the jellyfish in water and ice, and cut it into small pieces.
- Prepare a rather thick batter with water and flour, dip each pieces of jellyfish and fry in abundant seed oil.

Plate presentation

Place the tomato sauce on the bottom of a serving dish, lay the fried jellyfish morsels on top, and garnish with the dehydrated olives, capers, oregano and basil leaves.

Fried jellyfish by marine biologist

Silvio Greco, senior researcher at the Zoological Station "A. Dohrn", SlowFood expert and passionate cook proposed fried Mediterranean jellyfish in batter during the 2017 SlowFish event, as an example of virtuous - and tasty - practices for the protection of the sea.

In the photo: *Rhizostoma pulmo*, Macrì 1778



Jellyfish, Lampascione's Yogurt and Puntarelle Chicory

Dish tip: Starter/Appetizer

Preparation time: About 60 minutes + 12 hours

Servings: 2 servings

Ingredients

- 1 jellyfish (*Rhizostoma pulmo*, Macrì 1778)
- 500 g wild lampascioni (wild onion)*
- 500 g *puntarelle* (asparagus chicory)**
- 200 g greek yogurt
- 10 mint leaves
- 1 clove of garlic
- extra virgin olive oil
- white wine vinegar

Salt mixture (balanced salt)

- 1 kg salt
- 1 kg sugar
- 30 g wild fennel***
- 30 g wild dill****
- 30 g wild thyme

Leopoldia comosa*, (L.) Parl ; *Cichorium sp.* ; ****Foeniculum vulgare*, Miller ; *****Anetum graveolens*, L.

NUTRITION FATCS (100 g)		%DV *
Energy	119.3 kJ / 28.5 kcal	1%
Total Fat	1.3 g	2%
of which: Saturated Fat	0.4 g	2%
Monounsaturated Fat	0.7 g	
Polyunsaturated Fat	0.1 g	
Cholesterol	1.2 mg	0%
Total Carbohydrate	2.1 g	1%
of which: Sugars	1.1 g	1%
Dietary Fibre	1.2 g	5%
Protein	1.5 g	3%
Salt	0.02 g	0%
Calcium	48 mg	6%
Magnesium	11 mg	4%
Potassium	103.6 mg	61%
Sodium	9.8 mg	0%

(*)DV: The % Daily Value tell you how much a nutrient in a serving of food (100g) contributes to a daily diet (8,400 kJ / 2,000 kcal a day is used for general nutrition advice). (Reg. EU 1169/2011).



Preparation

- To make the salt mixture with herbs (balanced salt), wash all the wild herbs under running water, dry and finely chop them. Put in a salad bowl with salt and sugar. Mix thoroughly to distribute all the ingredients.
- Wash the jellyfish under running water, and marinate it for 20 minutes in the balanced and flavored salt mixture.
- Once the marinating time is over, wash well the jellyfish and dry it on a paper towel.
- Wash and clean the "lampascioni" under running water and leave them to soak for 12 hours taking care to change repeatedly the soaking water.
- Prepare 1 liter of water, add 15 g of salt and 15 g of white wine vinegar in a pot and bring it to the boil.
- Blanch the "lampascioni" in that acidified water for about 10 minutes, taking care to check their cooking status, and finally cool them in water and ice.
- Blend them with a mixer with the Greek yogurt, a garlic clove without the inner sprout, mint, extra virgin olive oil and white wine vinegar. Finally pass the mixture through a sieve.
- Wash the "puntarelle" chicories under running water, cut them finely and place them in a salad bowl with water and ice.

Plate presentation

Cut the jellyfish finely like a carpaccio, placing it on a serving dish with the previously drained and dried "puntarella" chicories and the "lampascioni" yogurt sauce.

Tasting notes

The dish in its simplicity presents a range of unusual flavours which in combination offer a unique experience. The bitterness of "lampascioni" and "puntarella" is balanced by the smooth acidic taste of the yogurt and the flavour and sweet-and-sour of the marinade with balanced salt, respectively. In this delicate balance fits the unusual salty sea taste of the jellyfish.



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