

Geology at the table

Cooking without borders



The Geological Surveys of Europe

Dear Reader,

During the past several years geology has become a topic of interest for citizens across the world, not only as a consequence of numerous natural disasters that have occurred in this past period, but also due to the general awareness that geology plays an important part in our daily life. Geological knowledge represents the pillars for mining, mineral and energy industry, for a safe living environment, and for a quality water supply, but geology is much more...

Leafing through the pages of this book you will realise how important geology is for the existence of our society and along with that you will also see the crucial role it plays in the complex world we live in. From what we eat (and drink) to the way our food is prepared, geology always plays a part. Every time we sit down at the dining table to enjoy a meal, our favourite dishes contain references to our past, to the present, and to the future, which can easily be analysed and explained through geology.

As the President of EuroGeoSurveys, the Geological Surveys of Europe, and on behalf of all of our members I would like to warmly thank all those who participated in the creation of this delicious book, and in particular to all of our colleagues from the geological surveys across Europe who provided the link between their national dishes and the geological context of these dishes. I would also like to thank all the non-geologists who believed in our project and supported it from the beginning.

A special acknowledgment goes to Mr. Andrea Beccaceci, the owner of the Restaurant "Ristorante Beccaceci" in Giulianova, Italy, who through his distinguished chefs Vito Pepe and Gianluca Tarquini, was able to create all the different recipes in this book.

A word of gratitude also goes to Quartiglia S.r.l., the Italian food company that sponsored the project, to FUSIONSalt Natural Cooking, and to Dr. Pietro Campanaro, the nutritionist and specialist in Food Science, who provided a short description on the nutritional value of each dish featured in this book. Finally I would like to thank the young and talented photographer Erwin Benfatto for all of the wonderful photos that emphasised the peculiarity of each dish.

Dear reader... The book you're holding in your hands is a special one. It's a geologically flavoured cook-book, the first of its kind in the world. I dare you to cherish the joy of variety of the European cuisine this book brings with your family and friends and to pass on the true meaning of the book – a unique pan-European friendship that thrives on the richness of our continent's diversity.



Marko Komac
President
EuroGeoSurveys
The Geological Surveys of Europe

The **Restaurant Beccaceci** was created in a year near the end of the nineteenth century. At that time, we have the first recorded review of the Pasquale Beccaceci hotel, which was located along the Adriatic coast, and offered food to its guests. In fact, the real beginning was in 1922 when Andrea, one of Pasquale's sons, married Anna Sabatini and branched out on his own to open a restaurant and bar in the square near the newly constructed railway station of Giulianova.

The restaurant began to blossom due to the culinary skills of Anna who ran the kitchen from 1922 until 1992. Anna was assisted by her son Carlo and they began the seafood restaurant that is currently in place. In 1984 Andrea Beccaceci began to collaborate with Anna and Carlo. Currently the kitchen is in the very capable hands of Vito Pepe and Gianluca Tarquini. They are both responsible for the overall management of Beccaceci Andrea.

The restaurant offers exceptional cuisine that combines the historical flavour of the original concept behind Pasquale Beccaceci Hotel with modern cooking techniques that are strictly bound to the local catch in the middle of the Adriatic Sea.



Vito Pepe is a young chef of just 27 years old who already has several years of experience behind him. He graduated from University of Teramo with a degree in food technology. He is not only a chef but also a teacher who specializes in traditional Italian cuisine. Before becoming head chef at the renowned restaurant Beccaceci, he worked at several restaurants along the Adriatic coast in Italy. Unique desserts and pastries are his passion.


Pietro Campanaro is a Nutrition specialist in Food Science and phytotherapist who has published several works in national and international scientific journals. He has given speeches at many conferences and congresses and he gives courses in the field of dietetics, human nutrition, and herbal medicine. In 2001 he founded the website www.fitomedicina.it. He is also co-authored the book entitled «Methodological Bases of the Psychonutritional Approach» (Ed. SEE Florence). In addition, he collaborates regularly on nutrition related articles with several monthly magazines and is often a guest on television programs to speak about food and natural remedies.



Erwin Benfatto is a young freelance photographer with an amazingly attentive eye to detail, accuracy and creativity. He has a background in the visual arts with extensive experience in the field of graphic design and WEB design. This has allowed him to stay at the cutting-edge in terms of his approach towards photography.



FUSIONSalt is a very young company, based in Mosciano Sant'Angelo, in the province of Teramo (Italy). Its core business is selling pink salt from the Himalayas. Pink salt has various different uses such as in the spa/wellness industry as a mineral that releases ions or as a flavouring in food. Manuela Fusella, the owner of the company, is a very dynamic businesswoman. She is currently developing a new use for the salt as a hot stone for cooking delicious dishes such as meat, fish and vegetables, but also as a base for serving food.

The  **QUARTIGLIA Group** has been operating for over 25 years making it one of the premier companies within commercial catering, the hospitality sector, and the food & wine industries. Quartiglia began in 1983 in Cologna Spiaggia, in the province of Teramo. It specialises in the sale and distribution of fruit and vegetable products but in recent years has branched out to cover various market areas, both fresh and frozen: meat, fruit, perishable goods, fish, etc...

Geology of Europe

Introduction

The geology of the European continent is extremely complex and variable. This is reflected in the wide variety of landscapes and natural environments that characterise this relatively small but highly diverse continent.

A first, rough, differentiation can be made between north-western and southern mountainous regions, and a large area in the north and north-east occupied by widespread lowlands.

The mountainous sector, separated from continental Europe by the Pyrenees, the Alps and the Carpathian mountain chains, is composed of the Iberian, Italian and Balkan peninsulas. Its natural boundary to the south is the Mediterranean Sea.

The north-eastern, more extensive, part covers an area of about 4,000 square km, from the English Fens in the west to the Urals to the east. It is represented by wide plains, bounded to the north by the Atlantic-Caledonian mountain chain running through Scandinavia to northern Britain and Ireland. Part of this lowland is submerged by the Celtic, North, Baltic and Barents Seas.

Geological History of Europe

The geological evolution of Europe has been driven by the movement, splitting and combination of continents, powered by plate tectonics. The history of the European continent can be traced back to the Proterozoic Aeon, about 2.2 billion years ago, when the Baltic Shield, the oldest area of the continent, was formed from the grouping of five different crustal blocks: Svecofennian, Sveconorwegian, Karelian, Belmorian and Kola. Later it formed the Sarmatian craton and the Volgo-Uralia shield. The union of these cratons led to the formation of the East European Craton (EEC, formerly known as Baltica or Russian Platform), which became part of the supercontinent Columbia between 1.9 and 1.8 billion years ago.

About 1.5 billion years ago, the supercontinent Columbia broke up, creating the supercontinent Nena ("Northern Europe and North America"), made up of the Arctica, Baltica and East Antarctica cratons. East Antarctica subsequently separated from the other two, which joined to the Laurentia supercontinent.

1 billion years ago, the Laurentia supercontinent fragmented: Rodinia broke away from the Laurentia-Baltic bloc; the latter formed the Proto-Laurasia that, about 550 million years ago, resplit itself forming Baltic and Laurentia blocks.

About 440 million years ago, the Baltic and Laurentia blocks collided again, forming the Euramerica plate; 350 million years ago, in the Carboniferous period, it joined with the Gondwana supercontinent forming the supercontinent Pangea. Twenty million years later, Pangea joined onto the Siberia and Kazakhstania continents.

During the Jurassic, about 190 million years ago, due to the opening of the Atlantic Ocean, the Laurasia continent separated from Gondwana and, shortly after, it fragmented into two blocks: Laurentia (North America) and Eurasia; this moment marks the birth of the European continent.

The collision between the Eurasian and the African continent, which began 65 million years ago, caused the uplifting and folding of mountain ranges that contour south-western Europe, coming to Asia. The two great mountain chains created by the plate collisions are the Pyrenean - Alpine - Carpathian and the Apennines - Dinaric mountain belts.

Summary of geological events in Europe

Years before present	Geological time	Geological event
2.6 million years ago	Quaternary	Glaciations and Interglacials
65 million years ago	Paleogene	Collision between Eurasia and Africa: uplifting and folding of mountain ranges that contour south-western Europe
190 million years ago	Jurassic	Pangea separated into Laurasia and Gondwana. Shortly after Laurasia fragmented into Laurentia (North America) and Eurasia; this moment marks the birth of the European continent.
330 million years ago	Carboniferous	Pangea joined onto Siberia and Kazakhstania
350 million years ago	Carboniferous	Euramerica block joined with Gondwana forming the supercontinent Pangea
440 million years ago	Silurian	Baltic and Laurentia blocks collided forming the Euramerica.
550 million years ago	Neoproterozoic	Proto-Laurasia resplit forming Baltic and Laurentia blocks
1 billion years ago	Neoproterozoic	Laurentia supercontinent fragmented forming Rodinia and Proto-Laurasia
1.5 billion years ago	Mesoproterozoic	Supercontinent Columbia broke up, creating the supercontinent Nena ("Northern Europe and North America")
1.9 - 1.8 billion years ago	Paleoproterozoic	East European Craton (EEC) became part of the supercontinent Columbia
2.2 billion years ago	Paleoproterozoic	Grouping of five different crustal blocks to form the Sarmatian craton

Geological maps for Europe available through the OneGeology portal



The European landscape

In addition to the complex geological evolution described above, the European landscape has been deeply marked by numerous geomorphological processes and climatic events.

The southern part of Europe, as well as Iceland, is actively undergoing intense tectonic movements that are associated with seismic activity (earthquakes) and volcanism. Evidence of ancient earth movements and volcanism are found throughout other parts of Europe that are now tectonically quiet, such as Ireland, Scotland, Wales, central France, central and southern Germany, Norway.

Rivers, with their erosive or depositional power, have shaped the morphology of the river plains, deeply eroding or incising the land and forming large terraced areas, or settling thick layers of alluvial deposits.

All of Europe's coastline, particularly in the north-west, is subjected to intense wave action and sediment transport.

Finally, the continuous succession of glacial and interglacial periods, still active in some areas, has contributed to modelling the European landscape we see today.

Marco Pantaloni
Geological Survey of Italy - ISPRA

Mahlzeit

Austria

Austria and the Alps together seem as inseparable as a brother and sister. From a geological point of view, two worlds meet here as the Alps represent, in simple terms, the crumple zone between Africa and Europe. Investigations on the varied geological history of the country, spanning millions of years, suggest that the rocks have been witness to some very turbulent times: tropical coral reefs and ice-filled valleys, deep oceans and flat tidal waters; lava-spouting volcanoes and wandering continents.

Geologically, the Austrian landscape is characterised, on the one hand by the young fold and over thrust mountains of the Eastern Alps, and on the other, by basin landscapes, wide agricultural valleys and narrow breakthroughs of the Danube and its tributaries. In the North the topography is dominated by rolling hills at the Southern end of the Bohemian Massif. They form part of the old eroded Variscan mountains which towered as a massive mountain range over what was once «former Europe» in the Palaeozoic era.

However, the periglacial loess is an extremely recent geological phenomenon of utmost importance to the Austrian wine culture and contributed to the co-evolution of the Austrian cuisine.

Loess consists of mineral dust which was winnowed in huge quantities, entrained and deposited by strong winds in the foreland of the great masses of glacial ice during the ice age. The result was a typically floury material – yellow, porous and easily friable between the fingers.

Heaps of mineral dust were created mainly by the abrasion due to flowing glacial ice, by strong frost weathering and abrasion during entrainment of debris in the rivers. Due to the extreme climate (annual average being 8-10° C colder), there was no complete vegetation cover. Therefore the flood plains of rivers, where the fine suspended solids were deposited, were exposed to the wind. Most of the winnowed materials were again deposited near the rivers. But even many miles away from their origin, there are blanket deposits of loess several meters thick.

Loess has excellent properties as a substrate for growing wine. These properties include a capacity for high storage of moisture and heat, the ability to bind and neutralize pollutants, as well as easy cultivation.

However, the main reason for its fertility is the broad range of inorganic nutrients like alkalis, alkaline earths

and trace elements contained in the loess due to the mixing of particles of different rocks mixed during entrainment by wind. Due to the fineness of the material, these nutrients are uniformly distributed in the soil and easily available to the plants.

Naturally, the quality of a wine depends on many other factors, such as climate, fertilisation, pruning, numerous steps during the wine pressing, and many other factors. But the specific character of wine, even of wine of identical grapes, in particular its taste and bouquet, is strongly determined by the type of soil. The various types of vine demand quite different contents of nutrients in the soil. Vine and soil must be compatible! Rich-bearing wines such as “Grüner Veltliner” or “Riesling” get very good results on Austrian loess.

Loess contains the three basic components of a good substrate, which are quartz sand, clay and lime, in a perfect composition. Wines growing on loess soils are characterised by their particular balance in taste. First and foremost a good wine should be enjoyed moderately as a drink, but there are also many delightful recipes, especially for soups and sauces. We recommend a “Veltliner Soup”, prepared with a bottle of “Grüner Veltliner”, as dry as possible.



H.G. Krenmayr is head of the geological mapping department of the Geological Survey of Austria and the national delegate to EuroGeoSurveys.

He holds a PhD in Geology from the University of Vienna. During his years

as active field geologist he specialised in the alpine molasse north of the Alps.



Veltliner Soup

1

- Fry one pound of chopped onion in butter, add a bay leaf and a piece of thyme. Deglaze with almost half a litre of Veltliner wine and add a litre of beef broth 15 minutes, season with salt and pepper.

- Dissolve a tablespoon of starch with Veltliner wine and add to stock for binding.

- Put Brie or goat's cheese on slices of white

bread and grill in the oven with top heat or under the grill. Serve the soup hot with the grilled slices of bread.

- And what to drink?

A "Grüner Veltliner", of course, dry or sweet, it's up to you!

2

Nutritional value

The soil characteristics are ideal for growing grapevines such as the Grüner Veltliner (native to Austria) and Riesling. Besides the pleasure in tasting them, the wines from these grapes can be used to prepare typical dishes such as the excellent Veltliner soup.

Poor in calories and enriched by the multiple properties guaranteed by the onion (help in detoxifying the liver, preventing tumors and protecting the body from cardiovascular disease), this soup is ideal to accompany fatter foods such as cheese.

A bottle of "Grüner Veltliner",
as dry as possible.



Bon
appétit

Smakelijk

Guten
Appetit!

Belgium

Known in French as “choux de Bruxelles” and in Dutch as “spruitjes”, Brussels sprouts (*Brassica oleracea*; Gemmifera Group) look like tiny cabbages, with a diameter of about 2 to 3 cm. Brussels sprouts grow along bulky stalks that may reach a height more than 1 m and support around 50 to 100 sprouts. They are very cold resistant and can easily support a small frost. Cooked properly, they have a delicate cabbage-like flavour, with hints of nuts. Brussels sprouts may be boiled or steamed, fried with bacon, or roasted in a hot oven.

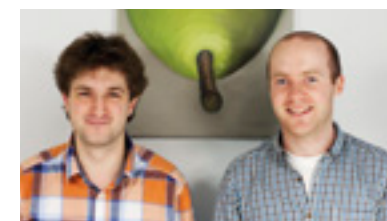
The exact origins of Brussels sprouts are quite unknown, with a hint of their culture around Brussels as early as 1213. During the 17th and 18th centuries, they became highly popular and eventually spread throughout Europe. Interestingly enough, the first known recipe for Brussels sprouts, “served on a thick round of toasted bread buttered”, was published in 1845 in what is considered the first general public cooking book, by Eliza Acton.

The success story of Brussels sprouts is directly linked to the geomorphology of the city of Brussels. Indeed, Brussels was historically established in the alluvial plain

of the Senne river that was covered by many marshes, ponds and streams (the water iris would besides become the symbol of the city). That particular landscape is of course related to the rainy oceanic climate but more particularly to the poorly permeable subsoil. The deposition of Holocene fine sediments resulted from human activity as early as 6000 B.P. and continued during the Gallo-Roman epoch and the Middle Ages. The upstream deforestation for agricultural purposes is responsible for increased run-off, erosion and transport. This resulted in high sedimentation rate of silts and clays filling the Senne valley, and in continuous high water levels in the alluvial plain. A marshy landscape has therefore developed between the meanders of the Senne.

In the early 13th century, Brussels grew significantly. To let the city expand, a second wall was erected in the 14th century, and gardening developed in the current municipality of Saint-Gilles, outside the main gates. Horticulture took a considerable expanse by drainage of the fertile marshlands and full occupation of the available land. Gardeners had to find ways to further increase their productivity to cope with the growing population of Brussels.

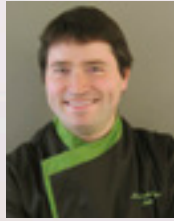
In the middle of the 17th century Saint-Gilles started to grow Brussels sprouts extensively on the productive alluvial soils, which, at that time, provided a better yield than cabbage as it grows in vertical stages. It is from this profitable crop that the Saint-Gilles inhabitants earned their nickname «Kuulkappers» (cabbage cutters).



Christian Burlet (left) is geologist at the Royal Belgian Institute of Natural Sciences - Geological Survey of Belgium (GSB). He graduated from the University of Liège in 2002. He works at the GSB on the GECO (Geology for a sustainable ECONomic development) project, involving mineralogy research on copper-cobalt ores and geo-materials in Katanga (Democratic Republic of Congo).

Geoffrey Cambier (right) is geologist at the Royal Belgian Institute of Natural Sciences - Geological Survey of Belgium (GSB). He specialised in sedimentology and graduated from the University of Brussels in 2009. He started to work at the GSB on a structural geology project (inventory of the major Belgian faults) and works now on a GIS three-dimensional geological modelling of the Brussels underground.





Benoit Cloes is the owner of the only French culinary bookstore in Belgium (Namur). He experienced high and fine gastronomy by working at the sides of famous Belgian and French chefs in starred-restaurants before opening his bookstore, Le Libraire Toqué, in 2010. www.lelibrairetoque.be

20 Brussels sprouts (about 300 g)
1 medium-sized onion
1 l chicken stock or chicken broth
80 g roux (half butter and half flour)
30 g butter
5 cl brown ale type "Abbey beer"
20 g Belgian chocolate (about 53% cocoa)
Salt - Pepper

Brussels sprouts velouté on abbey ganache

- Chop the onion and the Brussels sprouts.
 - Making a roux: in a saucepan, melt 40 g of butter. When it is melted, gradually add 40 g of flour and stir until the mixture forms a smooth paste with a light smell of biscuit, but without colouring the roux.
 - In a pan, lightly fry the sliced onion and Brussels sprouts in 30 g of butter.
 - Pour the chicken stock over the sprouts and let it gently cook for about 10 minutes.
 - Mix and filter the preparation to obtain a smooth texture.

- To make the velouté, pour the roux gradually in the mix. Stir until the mixture blends smoothly, beat vigorously and add the remaining quantity of roux, beating well after each addition. Correct the seasoning with salt and pepper.

- Making the abbey ganache: boil the brown ale in a saucepan until reduced and syrupy. Remove from the heat and add the chocolate and stir well.

Suggestion for the dressing

Draw a line of ganache with a kitchen brush on the plate and cover with soup.

Finish

Leaves of Brussels sprouts cooked in butter and pink peppercorns.

2 **Nutritional value**

Brussels sprouts, beer, and chocolate, what Belgium is known for around the world, are all present together in this tasty recipe, characterized by the presence of carbohydrates and fats but which is also rich in antioxidants as well as detoxifying sulphur substances, contained in the sprouts and onions and diuretic substances contained in the beer.

Also the amount of vitamins (A, group B, C and K) and minerals (phosphorus, iron, potassium and magnesium) contained in the various ingredients is significant. The use of chocolate guarantees the presence of polyphenol which aids in protecting the heart and facilitates good circulation.

Dobar tek

Croatia

Geographically and geologically, Croatia is a Mediterranean and Central European country. It looks like a croissant; the broader northern part of it belongs to the Pannonian Basin and the thinner, south, part belongs to the Dinaric mountain range and to the Adriatic coast. These two parts of the territory of Croatia are divided along the line running from the southern parts of the Žumberak Mt. to the Una River at the south. They are different in geodynamic evolutions, stratigraphy, lithology and geomorphology.

The Pannonian structures are represented mostly by the allochthonous Triassic and Paleozoic formations together with occurrences of Jurassic ophiolite mélange and deep marine deposits, Cretaceous shallow marine carbonates, Late Cretaceous-Eocene flysch and pelagites and Late Cretaceous-Eocene magmatic and metamorphic rocks. The Neogene extension of the Pannonian Basin System and concurring subsidence processes resulted in several thousand meters thick deposits of siliciclastic sedimentary rocks in the Sava and Drava depressions. More than half of the Pannonian part of Croatia is a chiefly lowland area covered by Quaternary deposits.


Dinaric region occupies the southern parts of the country. Geologically, it comprises a large carbonate succession of the Croatian Karst (External or Outer) Dinarides of great thickness (in some places over 8,000 meters) and ranges in age from the Middle Permian to the Eocene. During the Neogene, the thick lacustrine sediments were deposited in the intra-mountain basins. During the Quaternary, the fluvio-glacial erosion and accumulation products have been deposited in the Dinaric depressions.

Due to distinct geodynamic evolution both the Pannonian and Dinaric regions developed diverse bedrock geology and geomorphology. The climate conditions vary broadly from Mediterranean climate at the Adriatic coast, through the mountain climate in the Dinaric mountain range, to moderately continental climate in the Pannonian region. The relief also varies from lowlands in the eastern part of the country to big mountains along the coastline region, and hilly terrains such as Hrvatsko Zagorje (Croatian Zagorje) to the north. During long geological history from Paleozoic to the Quaternary, sedimentation was mostly in the water environment. About 5 million years ago Pannonian Sea retreated, the hills were uplifted and fluvial erosion formed the recent Hrvatsko Zagorje landscape.

Hrvatsko Zagorje occupies the area northwest from Zagreb in the Pannonian Basin. There are plenty of small villages, summer houses, medieval castles, small forests, vineyards and gardens. The hilly relief is quite not convenient for extensive agricultural production but it is ideal for traditional open-space poultry-farming in the small family farms. The most famous is Zagorje turkey, which usually goes freely around in small flocks. The Zagorje turkey originates from the Middle American turkeys which were imported into Hrvatsko Zagorje during the middle of the 16th century. Over a long period of time Zagorje turkeys have become domesticated with distinctive features and delicacy.



Ajka Šorša is employed at the Croatian Geological Survey as geochemists and GIS specialist. Her job includes lot of fieldwork which consists also of tasting local gourmand speciality.



Turkey
Salt
Goose fat or oil
500 gr all-purpose flour
1 egg
½ teaspoon salt
About 2.5 dl water

The Zagorje turkey with “mlinci”

Home-made pastry

- Salt the turkey from inside and outside and put it aside several hours, or during the night. Sprinkle turkey with goose's fat or oil. Put some water (1-2 dl) and turkey in the roasting pan. Roast it one hour for each kg of weight at the temperature of 200°C.
 - The turkey weighting 4 kg takes 4 hours to roast. During roasting pour the turkey over with drippings every 15-20 minutes.
 - “Mlinci” is traditional home-made pastry. It looks like tortilla. Mlinci are usually baked at the table of wooden cooker.
 - Use flour, egg, salt and water and mix firmly to make the pastry dough. Dough should be kneaded, gradually floured, divided into two pieces and finally put aside for 15 minutes.
 - Sprinkle the table with flour and roll the dough to 2-3 mm thickness, cut it into smaller pieces and bake. The cuts could be baked at the bake stone or in the oven at the temperature of 200°C for about 10-15 minutes until it turns golden brown.
 - Put the baked pastry in a large bowl, scale it with boiled salted water, cover the bowl and leave it for a few minutes (about 5 minutes). Strain the pastry and put in the baking pan with drippings, mix it up and bake in the oven for about 5 minutes.
 - Roasted turkey slices and serves with warm home-made pastry and lettuce.

2 Nutritional value
Here is a typical example of a recipe that, starting from a few simple ingredients allows to achieve a highly effective result. The white meat and lean of the free range turkey, carefully browned in the oven for several hours, combined with the simple mixture of Mlinci cooked on stone, result in a very tasty and complete dish. The final product is a perfect harmony between some key elements of the Mediterranean diet, such as carbohydrates and noble proteins of white meat while the lettuce leaves complete the dish with fibres and minerals.

ΚΑΛΗ ΟΡΕΗ

Cyprus

The geological significance of this recipe is two-fold. Firstly, it points to the geological significance of the south facing slopes of the island where viticulture is a 4000 year old agricultural activity. The vines are grown on terraces constructed since antiquity on the almost barren steep slopes of the Miocene Pachna Formation chalks and marls. The chalks beds have a small dip to the south; facing the hot Mediterranean sun all year round. Stone built terraces were constructed since antiquity in order to create narrow farm land along elevation contours. Soil and water collected behind the walls, creating useful agricultural land over time, on this otherwise barren landscape. The soils are thin, infertile and stony; poor in organic matter. They are calcaric-rendzic-Leptosols and calcaric-leptic-Cambisols which used to be referred to as rendzina soils, a soil term very familiar in Europe. The second geological significance of the recipe is that powdered white chalk or some rendzina soil is used in the first steps of the procedure in a sedimentation method by achieving a slightly raised pH of the grape juice, clear from sediments, grape seeds and other solids.

During autumn, local farmers collect grapes from the mountains on the island of Cyprus. Grape vine leaves are stuffed with rice and meat and cooked in casseroles. Grapes are eaten as fruit, made into wine, zivania (a hard alcohol), raisins or other sweets that prolong the life and nutritional value of grape juice. One such sweet is palouzes, a creamy sweet made from pure grape juice. It is very easy to make and the ingredients are easy to find. You can use white or red grape varieties, the ones usually used for wine making, or a mixture of both. If you cannot get a hold of fresh grape juice or make your own, you can use packaged grape juice.



Zomenia Zomeni has received a B.Sc. in Geological Engineering from the University of Arizona as a Fulbright scholar. She also holds a M.Sc. in Geological and Geophysical Engineering with research emphasis in rock mechanics from the same institution and a Ph.D. in Soil Science and Geology from Oregon State University.

She now works for the Cyprus Geological Survey where she serves as Head of the General Geology, GIS and Cartography Section.



Palouzes

Grape juice
White chalky soil
Flour
Rose water or citrus blossom water or essence
or basil leaves or rose-scented pelargonium
Coarsely ground almonds or walnuts



1

The first part of the recipe attempts to clarify fresh grape juice from impurities. This step is optional and not necessary if using packaged juice.

- Strain the juice, measure and pour into a big pot.
- Heat the juice but do not let it reach boiling point
- For every kilogram or litre of juice add 1 teaspoon of white chalky soil (or powdered natural chalk)
- Turn the heat down. Foam will form on the surface of the juice which you need to remove with a spoon
- The juice will clarify and become transparent and more sweet.
- Remove pot from fire and let the juice cool down for 1-2 hours. The chalky soil and other sediments will deposit at the bottom of the pot. Do not stir.
- Pour the juice into a clean pot avoiding the solids. Throw the solids away.

- If using clarified or packaged juice you can now start to make the palouze.
- For every litre of clarified juice you will need 100 grams of flour (the ratio is 10:1). You can use whole wheat flour if you wish
- Mix the flour with some cold juice into a smooth paste.
- Put the pot with the juice on the fire and heat. Pour in the flour paste and mix well.
- Stir continuously with a big wooden spoon.
- You can add the essence of your choice. Otherwise you can use some fresh basil leaves which you later need to remove.
- Keep stirring until it becomes creamy and boils over.
- Pour into small glass bowls and garnish with coarsely ground almonds and walnuts.
- Serve when cool as a desert or snack.

2

Nutritional value

This creamy dessert made from grape juice fully expresses the bond with one's territory. The cultivation of grapes on the island of Cyprus is older than 4000 years and the type of grapevines cultivated in terraces and well exposed to the sun, produces grapes rich in sugar that are particularly suitable for recipes like Palouzes. The nutritional properties of

grapes are manifold: it is a valuable source of minerals like iron, calcium and potassium, contains antioxiidating substances that help fight free radicals and substances that aid digestion. Moreover the almonds used to garnish this dessert are rich in magnesium and further enhance the contribution of minerals.

Dobrou
chut'!

Czech Republic

The geological composition of the bedrock and its soil cover are undoubtedly important factors governing the cultivation of many crops, the breeding and feeding of domestic animals and the supply of local products to the kitchen. As a result, regional cuisine was developed, and from this sprang the national dishes that have become an important part of Czech culture.

Many traditional Czech foods are mentioned in the old literature, some of them surviving to the present day. Peas, buckwheat, and some other pulses can be named, also mashed potatoes and the very popular potato pancakes (salty, not sweet as, for instance, in Germany and Austria). Some traditional meals are known by funny Czech names, such as "kuba" (the Czech version of the name Jacob).

National dishes are chiefly determined by the local availability of natural produce. The cultivation of these depends on the composition and fertility of the soil, as well as on topography, altitude and climate. It is well known that wheat grows well on fertile tchernozem (black earth) formed on fluvial sediments and loess. On the other hand, potatoes are not so delicate and can withstand shallow stony soils,

cambisols, brown soils and podzols at higher altitudes. These are typical of the Czech highlands, for instance the County of Vysočina with an average elevation of 400 m a.s.l. supplies more than one third of Czech production.

The landscape of the Czech Republic, like other countries, can be subdivided into different geomorphological units, each with its own system of soils.

- The plains, covering 5% of the surface of the Republic, consist mainly of fluvial sediments with fertile soils of tchernozem (black earth), fluvisol, organosol and podzol types.
- The lowlands, covering 20% of the Czech Republic, are formed mainly of younger sediments with fertile tchernozem (black earth). Areas such as the Polabí belt (along the Elbe River) and Haná in Moravia are thus the main source of cereals.
- The uplands form the typical Czech landscape covering 35% of the Republic. Different upland areas consist either of older sediments with a basement of metamorphic and/or igneous rocks, or of Cretaceous platform sediments.

The Cretaceous marlstones give rise to very fertile brown soils and podzols. The cambisols are also intensively cultivated.

- The highlands (25%) are elevated areas consisting mainly of older metamorphic and igneous rocks covered by cambisols. Potatoes are the main arable crop, but the grasslands provide pasture for cattle so meat and dairy products are also typical products from these areas.
- The mountains cover 15% of the territory of the Republic. The Bohemian Massif consists mostly of metamorphic, igneous and ancient sedimentary rocks, whereas the Carpathians consist of younger sediments. The cultivation of potatoes is possible in some low lying depressions, however farming is chiefly pastoral with cattle and sheep.



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Author of 30 scientific textbooks and books on popular science.



Old Bohemian mushroom kuba

1

- Soak the dried mushrooms in cold water overnight – they will absorb the water. Also overnight, soak approximately 300 grammes of the barley groats in water. This should be done in a larger container since they increase in size considerably as the water is absorbed.
- Take the mushrooms, salt them lightly and simmer them for about 5 minutes – then pour out the water and keep the mushrooms separate ensuring they do not start to dry out. Now, take the barley groats and begin cooking them. To get the consistency right, keep testing their hardness. They should not be too hard or too soft. When they are soft enough, but still firm, pour out the water and wash the groats with cold water to remove any milky residue that tends to form.
- Put the barley groats into a large bowl, add the moist mushrooms, salt the mixture, add pepper and a handful of marjoram. Then take cloves from a whole bulb of garlic, skin them and mix all the ingredients together thoroughly.
- In a separate frying pan, melt 2–3 table spoonfuls of butter and fry the chopped onion pieces lightly until they soften and acquire a glassy look, then turn out and mix together with the other ingredients.
- Finally, butter the inside of a medium-sized roasting pan. This will prevent the mixture from sticking to the sides while baking it. Empty the contents of the mixed bowl into the roasting pan, ensuring that you have a layer of approximately 5 cm. Bake for 20–30 minutes at 180 °C. Take out and serve hot.

2

Nutritional value

The fundamental elements of this ancient recipe are two widespread ingredients that are deeply linked to the territory of the Czech Republic: hulled barley grown in the plains and the good mushrooms from the mountain areas. Wisely combined with a little butter and spices they result in a simple, genuine and particularly tasty dish. Barley is a easily digestible cereal rich in minerals (iron, potassium, magnesium and zinc),

vitamins (many in group B) and amino acids important for the body. It also has anti-inflammatory properties especially for the digestive tract (stomach and intestines) and thus lower the cholesterol. In combination with mushrooms, which are also rich in minerals and other vitamins, this recipe offers a full plate that is very refreshing, not particularly fatty, and easily digestible.

Barley without husk
Butter
Larger onion
Salt, pepper, herb marjoram
Garlic
Dried mushrooms

Velbekomme

Denmark

Denmark is located at the eastern edge of the North Sea basin at the outlet from the Baltic Sea and North European rivers. Since Cretaceous time Denmark was characterised by almost continuous sedimentation of limestone, clays, silt and sand; deposited in a huge and varied deltaic system. At the same time the Danish area was tipping slowly towards the west- southwest so that in the central North Sea Tertiary sediments has a thickness of more than 1,500 meters while Cretaceous limestones are found at sea level in east Denmark. Therefore, together with the high sedimentation rate to the west, erosion took place in the east.

During several Quaternary glaciations the Danish sediments were eroded by the inland ice, taken up in the ice, mixed with sediments from the Scandinavian area and melted out again several times. The result is a mosaic of tills and melt water sediments of a thickness varying from almost nothing to more than 200 meters in the old Jutland valleys.

By the end of the latest, the Weichelian glaciation, Denmark was left as lowland with numerous islands and shallow sea, straits and fjords. Changes have occurred since, first due to sea level rise after the glaciation and later due to the isostatic up-lift of the north-eastern part of the country and sinking

of the south-western part – equalisation due to missing inlandice pressure.

Today the country is mainly lowland below 100 m.a.s.l., even partly hilly, and consist of the Peninsula Jutland, two major islands Zealand and Funen, and numerous minor island. The sea is shallow, seldom more than 50 meters deep.

Together with the natural exchange of North Sea water this gives the best conditions for a varied fauna with a lot of different fish and shellfish breeding. The kitchen middens from the pre-farming period also tell the history of a fishermen's society living from oysters, fish and game.

However farming expanded, and when it was at its maximum more than 2/3 of the country was farmland. During the 19th and especially the 20th century farmland pollution increased and today huge areas of the inner shallow seas every summer suffer from oxygen deficit and fish death. This together with overfishing has diminished the fishing in the inner Danish sea. But still many fish are landed from the North Sea and Skagerak, mainly for exportation to southern Europe, because the Danes eat so little fish that it is difficult to find variations of fresh fish in the cities.

Classic Danish fish are herring, mackerel, cod and European plaice. Herring is pickled, herrings and mackerel are smoked or fresh fried, cod is generally poached or fried and European plaice is normally fried. Cod and plaice are commonly filleted.

There are however many different flatfish species in the Danish shallow seas and one is the common dab (*Limanda limanda* L., *limande commune* (fr) or *kliesche* (de)), which is normally caught as a side catch fishing for European plaice (*Pleuronectes platessa* L., *plie commune* (fr) *scholle* (de)). The plaice is sold for common consumption and both are sold commercially as fried fish fillets. Fillets from the dab and the plaice are almost alike in taste, but the meat of the dab is whiter and finer.

The fried fish fillet is estimated on Danish open sandwich ("smørrebrød") served at lunch. The fried fish fillet is either maid of the plaice or the dab, but other flat-fish fillets may also be used, say sole, lemon sole and European flounder. The bigger flounders, turbot or brill are sold as entire fish.



Jens Stockmarr is senior scientific advisor at Geological Survey of Denmark and Greenland (GEUS) and holds a M.Sc. from Copenhagen University in geology, specialised in the late Quaternary period. For many years Jens Stockmarr worked as hydrogeology expert and team leader in water management, monitoring, legislation

and administration at GEUS and international. Today Jens Stockmarr works in GEUS' Management on scientific/institutional strategy.



Shooting Star

Stjernesked

For frying

2 fish filets (common dab or European plaice) (80-100 g each)
2 spoonful wheat or coarse rye flour
or 1 egg and 2 spoonful breadcrumbs
Salt and pepper - Butter and olive oil for frying

For poaching

2 fish filets (common dab or European plaice) (80-100 g each)
1 L water - 2 dl white wine
1 slice of onion
Juice of ½ a lemon
5-10 peppercorns - Salt

For serving

2 slices wheat bread
4 lettuce leaves
½ dl crème fraiche
2 tomato slices
4 asparagus (fresh or preserved)
100 g fresh poached shrimps
2 spoonful nordic lumpfish or whitefish caviar
Dill leaves - 4 lemon wedges

1 • Two fresh dab or plaice fillets are first wiped with a piece of kitchen paper. Turn the filets in wheat or coarse rye flour with salt and pepper, and leave the filet 10 minutes before they are fried. Throw away the rest of the flour. Fry the filets on the pan in a mixture of butter and olive oil until they are golden (3-4 minutes on each side).

Instead of flour you may turn the filets in a whipped egg and afterwards in breadcrumbs. Add salt and pepper and fry the filets immediately.

Two fresh dab or plaice fillets are rolled (fix them with a wooden toothpick). Bring the water, with salt, the slice of onion, lemon juice and peppercorns to cook. Add white wine and turn of the energy. Poach the fillets approximately 8 minutes and take them up. Fry the white bread either on the frying pan used for frying the fish or in a toaster.

Place the bread on the plate put lettuce on the bread; add the fried fish fillets and the poached rolled fillets above (without toothpick). Add the crème fraîche on top of the fish and garnish with tomato slices, asparagus pieces, shrimps, caviar, and dill leaves. Serve with lemon wedges.

2 Nutritional value

The excellent fish from the cold seas of the North are one of the fundamental elements of traditional Danish food. The relatively shallow waters rich in nourishment makes certain types of fish tasty and very nutritious with a good supply of protein and especially an excellent supply of essential fatty acids (omega 3). Omega 3's are very important for the health and for the control of blood fats.

Fillets of Dab simply breaded and fried, served with rye bread or processed, alongside vegetables such as the Shooting Star always give an excellent final result which is a tasty dish and a good combination of highly digestible protein and carbohydrates.

Hyvää Ruokahalua

Finland

The bedrock of Finland is part of the Precambrian Fennoscandian Shield that constitutes one of the oldest cratonic areas in Europe. On top of the ancient bedrock there is a veneer of young sediments deposited during and after the latest ice-age. The Finnish landscape is characterised by undulating mountain ranges and tundra in Lapland and in the northeastern parts of the country, while central and southern areas tend to have lower topographic relief. Esker ridges and moraine landforms are present everywhere in Finland as a result of recent glacial and glacio-fluvial activity, and western coastal areas are still actively rising due to post-glacial rebound.

Climatically, Finland belongs to the boreal coniferous forest zone. Most of the country is covered by a mixture of spruce, pine, and birch forest, interspersed with extensive wetlands and lakes. Due to its location at high latitudes, Finland is a land of extremes: in most of the country the Sun does not set before midnight during the summer months, while conversely, daylight in mid-winter lasts for only a few hours, even in southernmost Finland. The summer in Finland is generally warm, although too short, and the winter is long, cold, and snowy.

The traditional forest culture still lives on in Finland, with the majority of the population enjoying outdoor recreational activities associated with nature; hiking and skiing, picking mushrooms and berries, fishing and hunting, and bathing in the 2.5 million Finnish saunas, mostly along lakeshores - all things that the Finns basically cannot live without. Moreover, outdoor life is made very easy by legislation that allows anybody and everybody to wander and camp out freely in the forests, and harvest the fruits of the nature even on private land, so long as you respect other landowners' property.

Many specialties in the traditional Finnish cuisine are also made out of things that come from the forest; likewise the Rosvopaisti, or 'Sheep Stealer's Roast Mutton' as it might freely be translated - despite the fact that it's quite often made from moose or reindeer meat or other forest game. When one starts preparing this dish the first thing to do is to find a suitable sandy spot for digging a pit for burying the roast. In Finland such places are most often found on eskers that are composed of well-sorted glacio-fluvial material, and therefore easy to excavate, having also traditionally served as building sites for houses, and cemeteries, and as vast resources for construction aggregate.

Furthermore, in the pine and spruce forests surrounding the eskers, you can find chanterelles and other mushrooms, as well as wild berries like blueberry, cranberry and, if you are lucky, cloudberry, which you can use for side dishes and desserts - especially if you happen to have some delicious Finnish dairy produce on hand!



Akseli Torppa - Geologist, M.Sc.
Researcher - Geological Survey of Finland (GTK)
Akseli Torppa is expertised in Precambrian geology, bedrock geochemistry, high-technology metals, and applied geosciences.
His major research interests are focused on REE deposits and, conversely, on geological

quality characteristics of construction stones.
In his current work, Mr. Torppa has had a change to travel broadly and, along with his geological experience, build up knowledge on the culinary arts worldwide. One of his latest areas of interest is associated with the traditional Mongolian cuisine.

In addition to cookery, Mr. Torppa's favourite pastimes include sailing, nature hiking, literature, and cultural history.



Sheep stealer's roast mutton

Rosvopaisti

1 Rosvopaisti

- First, find a sandy spot, preferably on top of an esker, and prepare a pit oven by digging a hole 50 cm deep, measuring some 70x70 cm in width. Leave a recess in the bottom of the pit, lined with firebricks (if available), and line the walls of the pit with stones

- Heat the oven by burning a good campfire in the pit for a couple of hours

- Take a boneless mutton leg that has been kept in coarse salt overnight (also moose or reindeer meat, beef, or even pork can be used). Rinse the meat with fresh water to clean off the salt grains. Make small cuts in the meat with a knife and put garlic cloves in them.

- Mix the spices and herbs with honey to make a paste, and spread it on the meat. Tie up the meat and put branches of sage and rosemary, and leaves of laurel under the ties. Wrap several layers of wet wax paper around the meat and foil the whole thing in aluminium foil.

- Move the glowing coals in the pit aside with a shovel, place the mutton packet in the pit, and cover it with the hot coal. Fill the pit with dry sand and leave the mutton to cook for about 3 hours. Meanwhile, you can sit on the esker and watch the midnight sun! Please, be careful not to burn your hands when you dig out the cooked mutton from the pit oven, and be sure to brush the sand off the foil wrappings before you open them!

Side dishes

- Serve the roast mutton with chantarelle sauce, cooked potatoes, and fresh salad

Chantarelle sauce

- Put 1 litre of fresh chantarelles on a frying pan, and fry over a medium-high heat until water has escaped. Add the chopped onions, garlic, curry, and butter, and cook until the onions are soft and translucent

- Blend flour into the mushroom-onion mixture, and add the cream and milk. Let cook over a gentle heat for some 20 minutes. Season with salt and pepper



Rosvopaisti

1½ - 2 kg boneless mutton leg
5-10 garlic cloves - Coarse salt
1 tsp mint - 1 tsp marjoram
2 tsp rosemary - ½ dl honey
1 rosemary branch - 1-2 branches of sage
3 leaves of laurel

Chantarelle sauce

1 l fresh chantarelles
1 onion - 1 garlic clove
3 tbsp butter - 1 tsp curry powder
½ dl wheat flour - 4 dl cream or milk
Salt - white pepper

2 Nutritional value

This recipe, particularly tasty, is prepared and cooked with a very original process. The meat, seasoned with salt and then washed, is then «scented» with a sauce made from different spices each of which brings a different flavour and beneficial properties (antioxidants, digestive tract). The addition of honey completes the sensory experience of this roast, giving you

the possibility to taste all the nuances from sweet to bitter and salty to spicy.

The dish is completed by proteins with carbohydrates that come from potatoes while the mushrooms together with onions provide fibres but also a certain amount of fat (butter and cream).

Bon, appétit

France

Geodiversity of France

Snow and ice covered mountains, volcanic cones in their youth, granitic cliffs, deep canyons, caves, sculptured forms of chaotic rock and folded structures, fertile plains ... A land of contrast and of diversity this is how France reveals itself to the eye of the traveller who crosses it. This diversity in landscape reposes on and mirrors a geological diversity. Granite, sandstone, limestone, clay, sand and schist, uplift, erosion processes: just so many rocks and phenomena that speak to us of the why and the how of France's regions: Perigord, French Brittany, Vosges, Causses, Cantal, Loire valley, the Cevennes or the Mont Blanc...

Overseas, french territories feature a wide variety of geodynamic contexts that are representative of the earth's crust: fragments of oceanic (French Polynesia) and old continental lithosphere (French Guyana), subduction zones (Martinique, Guadeloupe in the West Indies) and obduction zones (New Caledonia) and even a few hot spots (Reunion island). Surficial processes, more gradual but very active, also contribute to geological diversity: weathering and erosion, landslides, coastal sediment transport, reef-building...

Recent geological studies have revealed the strong relationship between biodiversity and the lithology of the subsurface. The chemical and physical diversity of rock directly influences the distribution of life forms. From the earliest stages of colonisation by plant life to

the development of soils and man's continuing use thereof, subsurface lithology is a significant parameter to be considered. Where land use obscures so much, geology is the element of landscape that is hardest to grasp. Yet it is an essential determinant of the character of natural habitats and how man has come to use them. Since a very long time farmers know that there are better soils than others, that asparagus grows better in sand than in limestone, that like many other plants chestnut prefers silica rich soils...

In recent years, agriculture must meet increasingly high expectations from consumers relative to quality, health safety and respect for the environment. This new context is a reminder that agriculture lies rooted in a natural environment possessing resources both limited and vulnerable. Geologists have a crucial role to play in what use is assigned to the land and how it is developed.

The Alsace Region in the northeastern part of France is famous for the quality of its food and wines and the diversity of its geology: igneous Vosges, sandy Rhine Graben and in between a patchwork of different sedimentary rocks ranging from the late Paleozoic to the Present.

North of Strasbourg, Soufflenheim is a small traditional village famous for its traditional culinary pottery which, like many other European pottery centers, goes back to the Bronze Age. In 1850, across the Lower Rhine Valley in Alsace thirty communities were engaged in this

activity. Today, there are only two remaining: Soufflenheim and Betschdorf. The quality of the clay used at Soufflenheim is recognised for its very good cooking characteristics: It is ideal for baking dishes and it easily withstands high temperatures.

The raw material clay is Pliocene in age and can be found in the forest of Haguenuau, north of Strasbourg, within the Rhine Graben which is part of the perialpine Cenozoic rift system. This rift system like those of Limagne, Bresse, Ruhr, Leine and Eger, formed during the Cenozoic and is contemporaneous with the Alpine orogeny. They are spatially associated to alkaline volcanoes (Massif Central volcanic province, Kaiserstuhl...).

Also called the «Monday dish», the Baeckeoffe was traditionally prepared on Sunday evenings and cooked the next day, laundry day, in the baker's oven, taking advantage of the remaining heat of the oven after finishing baking bread. Around noon, one of the children brought the Baeckeoffe home and the family could sit down to eat. This allowed women to take care of their clothes without interruption until the dinner hour.

The Baeckeoffe was originally a stew of potatoes and pork to which were later on added beef, lamb and even geese. The pieces of meat marinate overnight in a dry white wine from Alsace. They are then allowed to cook on a bed of potatoes, onions and carrots. Baeckeoffe is traditionally cooked in a pot named after him and is crafted by potters in Soufflenheim.



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Baeckeoffe

1 First part of the preparation: 24 hours before the lunch or the diner

Take 40 minutes between two phone calls, a scientific paper to review, 2 reports to complete and a pile of mails from Eurogesosurvey for the preparation of the maceration.

- Open the white wine and serve yourself a glass to give courage. If you need an excuse, say it's to make sure it is not corked.
- Pour the rest of the bottle (if there is some left over, if not open a new bottle) in a large pot. Add a whole onion with cloves and another, previously chopped.
- Then the two garlic cloves, peeled and crushed with a half stick of celery finely diced. Add the leeks, washed and sliced. Tie the bouquet garni in the leek to look pretty. Half a tablespoon of salt and a few turns of pepper.
- Cut all the meat in pieces of equal size, a volume larger than a small matchbox, and smaller than a large matchbox. Put everything in the dish, cover and place cool.
- After all that hard work take the time to rest and to empty your mailbox with a glass of the gewürztraminer that you plan to serve the next day to your guests.

The next day, 4 hours before the arrival of your friends: 2nd part of the recipe

- Peel the potatoes, wash them and cut them into slices of even thickness (about 6 mm). Do the same for the onions. To save time, preheat your oven, thermostat 5/6.

2 Nutritional value

The stew of potatoes and marinated meat make this recipe really good and tasty, bringing together all the characteristic elements of the Alsatian region: sweet potatoes, various types of local meats marinated in white wine from Alsace, yellow onions and fat of goose are all cooked in the local clay pot. Curious and very traditional, the preparation of this dish consists of the slow marinating for 24 hours of the meat, which thanks to all the herbs become soft and tasty. While the slow cooking in the oven for about 4 hours in the ceramic pot allows the

- Rub the goose fat (or butter or lard) on your Baeckeoffe dish. Arrange a layer of sliced potatoes, one of meat, one of onion, add a little salt and start to finish with a layer of potatoes.
- Strain the juice from the marinade and pour it into the dish. The liquid should be flush with the top layer, if not, add some more Alsatian wine.
- Note to purists: add a tail and/or a pig's trotter. For the gelatin
- Cover the Soufflenheim Baeckeoffe pot
- Note to purists: make a roll of dough to seal the lid: the day before, mix one pound of flour, 15 ounces of water, a pinch of salt and possibly an egg yolk for the shiny look. Mix and allow to stand overnight in the fridge. Before turning the Baeckeoffe in the oven, close the lid with the dough.
- Slide the Baeckeoffe in the oven. Gas Mark 6 for 1:30, then turn down to gas mark 4 for 2 to 3 hours. Relax if your guests are late because the Baeckeoffe will only be better if the cooking time is extended). Prepare the house.

Serve the Baeckeoffe with a fruity Tokay d'Alsace (now called Pinot Gris after a memorable european fight with the hungarian Tokay) or a Riesling if you prefer a wine more nervous.

potatoes to bind fully with the rest of ingredients. The Baeckeoffe is a complete and «robust» meal, characterised by the presence of carbohydrates from potatoes, of proteins that come from different types of meat and, of minerals and fibers from onions, leeks, carrots and celery. In particular, it is important to pinpoint that the use of such substances as sulphur contained in the onions and leeks acts as a detoxifying agent that protects against cardiovascular disease.



24 hours of marinating
60 minutes preparation
4 hours of cooking

750g of beef (chest or pallet)
750g of lamb (boneless shoulder or neck)
750g of pork (shoulder, loin or neck)
2 kg of resistant potatoes
3 large yellow onions
2 carrots
80 g of goose fat

For the maceration

1 to 2 liters of dry white wine from Alsace
2 yellow onions - 2 cloves garlic
3 leeks - 1 clove
1 celery stalk
Salt pepper - 1 bouquet (thyme, bay leaf, parsley)

Guten Appetit!

Germany

Looking at the geological map of Germany, one sees a colourful mosaic that reflects the complex pattern of rock(units) of various age, composition and structure. The pattern is the result of hundreds of millions of years of plate movement, magmatism and mountain building, erosion and sedimentation, metamorphism and glaciation.

The oldest rock units in Germany are those of the metamorphic Precambrian and are mainly located in the southeast of Germany. They comprise strongly altered magmatic and sedimentary rocks (Black Forest, Vosges, Bohemian Massif), but they have been overprinted by the later Variscan orogenesis. These are seen in the Bavarian and Oberpfälzer Forest, the Erzgebirge and the Lausitzer Bergland, the Sächsische Granulitgebirge, the Münchberger Gneismasse, the Black Forest, and parts of the Odenwald and Spessart.

The Northern German Lowland is covered by more than 1000 meters of Phanerozoic sediments, sedimentation that is still ongoing. Deep drillings have reached the Caledonian basement that comes close to the surface in the German part of the Baltic Sea, just north of the island of Rügen, in the very northeast of Germany.

North and south of the Variscan fold belt were fore-deeps with shallow seas into which large estuaries fed. These provided the environment for the later coalfields of the "Ruhrgebiet" in Northwest Germany. In those times the climate was warm and large parts of Germany were covered by jungle and poorly drained land, providing rich organic material.

Germany was a marine domain in the Jurassic and thick limestones, sandstones and clay stones were deposited. Indeed, they are the stratified and southeasterly dipping sediments of the Jurassic and Triassic periods that provide the foundation for large areas of southern Germany's landscape, the "Schichtstufenland" of Franconia, Swabia and Southwest Thuringia. These periods of our geological history were abounded with life and thus left us with a rich fossil heritage (e.g. ammonites, shells and dinosaurs).

Marine sedimentation continued into the Cretaceous period and "chalk" (e.g. on the Island of Rügen) and clay stones were deposited together with sandstones representing the coastal zone of the time. (e.g. in the Teutoburger Forest, on the northern boundary of the Harz Mountains and in the Elbe Sandstone Mountains).

Sandy soil is the ideal surrounding for growing asparagus, as its softness allows a quick warming in spring and the growing of straight asparagus sticks. In the Lüneburg Heath region (sandy glaciofluvial deposits from the Saale glacial stage, ca. 300 000 – 130 000 years ago) very fine white asparagus is being harvested in May and June.

This asparagus, cooked to perfection and accompanied by boiled new potatoes, hollandaise sauce with garden herbs, slightly cured ham from the Holstein region and a glass of Grünschiefer-Riesling from the Hunsrück region is a traditional and delicious Northern German spring dinner.



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Europe-Subcommission of the Commission of the Geological Map of the World. She authored the 1: 5 Million International Geological Map for Europe and Adjacent Areas as a GIS and paper map. Kristine is member of the EGS Spatial Information Expert Group. As leader of the German Geoscience INSPIRE Expert Group and

member of both the EU Drafting Team "Data Specifications" and the EU Thematic Working Group Geology and Mineral Resources, Kristine is intensely involved in creating the implementation rules of the new EU Directive INSPIRE.



White Asparagus, Hollandaise Sauce, New Potatoes and Holstein Ham.

1

Hollandaise sauce with herbs

• Begin by placing the egg yolks in a small bowl and season them with a pinch of salt and pepper. Then place them in a food processor or blender and purée them thoroughly for about 1 minute. After that, heat the lemon juice and the aceto balsamico in a small saucepan until the mixture starts to bubble and simmer. Switch the processor or blender on again and pour the hot liquid on to the egg yolks in a slow, steady stream. After that, switch the processor or blender off.

• Now, using the same saucepan, melt the butter over a gentle heat, being very careful not to let it brown. When the butter is foaming, switch the processor or blender on once more and pour in the butter in a thin, slow, steady trickle; the slower you add it the better. When all the butter has been incorporated, wipe around the sides of the processor bowl or blender with a spatula to incorporate all the sauce, then give the sauce one more quick burst and the sauce should be smooth, thick and buttery. Now, add the freshly chopped herbs according to your taste, salt, nutmeg and freshly ground pepper.

2

Nutritional value

This dish is very complete and articulated, well suited to the late spring climate of Germany of asparagus season. All the main nutrients are well represented by the various ingredients asparagus, potatoes, ham, eggs and butter. The asparagus provides fiber, vitamin A and B,

Ham

• Take only slightly cured ham (e.g. Holstein ham, from Northern Germany), taste should not be too strong to spoil the fine flavour of the asparagus.

Asparagus

• Choose fat white asparagus, peel with a vegetable peeler, cut off the ends. Use a big high pan, wide enough to take the asparagus lying down, or tall enough to have the asparagus standing up, with heads just within the water.

• Fill the tall or wide pan with water, add salt and sugar and bring the water to a gentle boil. Place the peeled asparagus in the pan, turn down the heat so that the water is just simmering. Close the pan half with the lid.

• Boil the asparagus soft enough for your liking. Remove from pan, drain somewhat and place on a preheated serving tray. Serve immediately with the ham, hollandaise sauce and boiled new potatoes.

• We recommend chilled Grünschiefer-Riesling.

and many minerals including phosphorus, magnesium, zinc, copper. It also contains especially large quantities of potassium that is good for the heart and muscles in general. They also act as diuretic and depurative agent.

Hollandaise sauce with herbs

- 2 large egg yolks
- 1 dessertspoon lemon juice
- A sprinkle of aceto balsamico to your taste
- 4 oz (110 g) butter
- Lovage and chives from the garden, freshly chopped
- Salt and freshly milled black pepper
- A pinch of nutmeg

Asparagus

- 3 kg white asparagus asparagus (for four people)
- 1 tablespoon sugar
- 1 tablespoon salt

ΚΑΛΗΝ ΟΡΕΕΣ

Greece

Located in the Aegean Sea, Santorini has a distinctly «Mediterranean climate» Mediterranean climate that is characterised by warm temperatures (202 days of sunshine a year, an annual average temperature of 17,5 °C and virtually no frost), low rainfall (maximum annual rainfall of 370 millimetres) but high humidity (average annual relative humidity of 71 %), while northerly winds prevail throughout the year.

The parent material of the volcanic soil which makes up nearly all of Santorini consists of tertiary deposits of Thira soil, pumice and lava. This soil is classified as deep, with moderate to no erosion gullies and slight gradients. Generally speaking, this soil has a fine structure and does not contain any basic inorganic nutrients such as potassium or nitrogen. It is also particularly lacking in organic matter. Lastly, land water resources are minimal to non-existent.

These geoenvironmental conditions favour the production of exceptional agriculture products such as “fava”, “tomatoes” and “wine grapes”, with special physical and chemical properties giving them unique taste qualities.

Fava (sweet pea-beans) with particularly high content of protein and carbohydrate has physical and chemical properties that give it a soft and light texture and a slightly sweet taste. Another advantage of fava is that it is very easy to cook (very short cooking time).

Santorini tomato, often called “cherry tomato,” is tiny as it is appetising and is renowned for its distinct flavour. The plant bears more fruit than ordinary tomato plants, matures earlier in the year, maintains its deep red colour with much greater consistency than other “cherry tomatoes” and requires no watering.

The vines in Santorini are cultivated in low basket shaped crowns, close to the ground for protection from the strong winds which provide excellent growing conditions for the creation of the superb Santorini wines. Assyrtiko is the island's flagship grape. The grape is often referred to as a “white grape in red's clothing,” due to the full-bodied wines it produces with an average of 13.5% abv. The white wines from Santorini are bone-dry with a distinct aroma of citrus combined with hints of smoke and minerals from the volcanic soil. They can be enjoyed on their own or with grilled fish and meats.



Eleftheria Poyiadji (left)

Engineering Geologist working with the Greek Geological Survey EKBAA-IGME since 1986. She is actively involved in geological - geotechnical studies of areas affected by Natural Hazards.

Nikolaos Arvanitidis (right)

is senior scientist at the Institute of Geology and Mineral exploration (IGME) in Greece working as economic

geologist on mineral exploration and development projects, from ore deposit geology and commodity assessment to industrial exploitation. National Delegate and Chair of the Mineral Resources Expert Group at EuroGeoSurveys.

He holds PhD in ore petrology and geochemistry from the Geological Institute of the Stockholm University.

For more 25 years involved in European and International R & D projects as coordinator and participant, and more than 10 years in evaluation of proposals and technical reviewing of projects addressing FP6 & FP7 SPACE-GMES calls.



Santorini fava

1 Fava

- Wash the fava lentils very well. Set to boil for 10 minutes in high heat in enough water. Then pour this water. Take another pot (large non-stick cooking pot) and sauté the finely chopped onion (one) in olive oil and when they start browning then pour in fava. Mix the onion with fava for about 3 minutes.

- Then add water enough to cover the mixture and cook it for about 30 minutes. Keep checking in case the fava has dried out.

- When the fava is cooked well (mashed) add salt and pepper. Allow cooling slightly and

serve with lemon, small amount of uncooked olive oil and finely chopped onion and parsley.

- Fava can be served as an appetizer or as main dish combined with fish or meat dishes. A very good combination is fava with "Beef liver".

Beef liver

- Cook in a large non-stick cooking pot all above ingredients for about 45 minutes in medium heat. Keep checking and add little water if needed.

Enjoy your meal with a glass of Santorini white wine!

2 Nutritional value

The volcanic soil and the very particular microclimate allows the original "Santorini fava beans" to grow. Those vegetables rich in carbohydrates and proteins, cooked simply with onions and high quality extra virgin greek olive oil, provide this quite tasty and full of nutrients dish. Like all legumes which are a mainstay of the Mediterranean diet, Santorini fava beans are rich in minerals, vitamins and

fibres. They are quick and easy to cook, which help in maintaining their nutritional value making them easy to digest unlike other vegetables. The combination of the cream of beans with beef liver makes this dish much more robust in terms of the protein and fat content. Liver is a meat rich in cholesterol, balanced by the anti-cholesterol properties of the Santorini fava beans.

Fava

500gr Santorini fava
2 onions finely chopped
1 cup of Greek olive oil
Lemon, salt, pepper, parsley

Beef liver

750gr beef liver medium chopped
2 onions roughly chopped
1/2 cup of Greek olive oil
Lemon, salt, pepper
1/2 cup of red wine

Jó étvágyat

Hungary

Hungary lies in the central part of the Pannonian (Carpathian) Basin system, surrounded by the Alps, the Carpathians and the Dinarides. Its landscape is mostly characterised by lowland areas, which represent the surface of young Neogene basins, filled up by several thousand meters thick sedimentary successions. These plains under a sunny continental climate are rich agricultural lands providing wheat, corns and a great variety of tasty fruits and vegetables for the Hungarian kitchen.

However these peacefully undulating lowland areas, dissected by some lower mountain and hilly ranges cover deeply buried mountain ranges in the basement, which are evidences of dramatic geological events in the past: the collision of two lithospheric plates, the African and the European. This resulted in a complex mosaic-like pattern setting of Palaeozoic and Mesozoic carbonate and crystalline rocks, and their east-northeast to west-southwest arrangement in two large structural units: the Tisza Megaunit which was once part of the European Variscan Belt, and the ALCAPA (Alpine-Carpathian-Pannon) Megaunit once belonging to the African plate.

These two megaunits drifted next to each other about 15-20 million years ago, which was followed by the formation of the Carpathian Basin, triggered by the thinning and thermal subsidence of the lithosphere in connection with the orogenic folding of the Carpathians in the Miocene. The subsiding area was occupied by a huge brackish to freshwater lake.

The uplift and erosion of the surrounding Alpine-Carpathian mountain belt supplied a significant amount of sediments via large fluvio-deltaic systems into Lake Pannon resulting in the accumulation of a 5000 to 7000 m thick sedimentary succession.

River deltas that entered the basin from the northwest and northeast progressed to the south, so finally the lake basin got filled up. From the middle Miocene onwards strong volcanic activity took place in the Carpathian forelands forming also a mountain range built up of predominantly andesite and rhyolite, which can be traced from the Visegrád Mountains to the Tokaj Mountains. These volcanic hills are hosting wine-yards on their southern slopes which produce the famous Tokaj and Eger wines in North-Hungary.

Many well-bedded sedimentary rocks are found in Hungary which may remind to the layered structure of the Hungarian cake "Vargabéles" (Tailor's pie), so we can compare the beauty of the structures with the flavour of the cake.



Annamária Nádor (left) (geology link to recipe) geologist, coordinator of several international geothermal projects, and also teaches geology at the faculty of Earth Sciences at the Eötvös Loránd University, Budapest.



Eszter Várady (right) (author of recipe), originally interpreter and translator, kept a food blog in her native Hungarian and turned an amateur interest in gastronomy to professional occupation. Currently she is director of Budapest-based Essencia Cooking School.



Vargabéles

4 sheets of phyllo pastry (réteslap)
125 g angel hair pasta (cérnametélt)
2 eggs
2-3 tbsp sugar
half vanilla pod
25 g butter, softened
150 g túró or cottage cheese
1-2 tbsp sour cream
Zest of half a lemon
Optionally: handful of raisins

Courtesy of Eszter Várady

1

- To make the filling, cook the pasta in boiling water according to packet instructions, drain and let cool.
- Divide the eggs. Beat the whites with a pinch of sugar until stiff.
- In another bowl, mix the yolks with the sugar, the vanilla seeds scraped out from the pod with a sharp knife, and the butter using a hand-held mixer. Stir in the cottage cheese or túró, the sour cream, and the grated lemon zest. Add raisins if using. Finally, fold in the pasta and the egg whites.

- Preheat the oven to 160°C.

- Smear each sheet of phyllo with oil or melted butter, and line a rectangular tin with 4 of them. Pour in the filling, even out with a spoon, fold over any phyllo hanging over, and cover with the rest of the pastry.

- Smear with melted butter and bake for approx. 45 minutes. Check if the top browns too quickly, and cover with tinfoil if necessary.

- Serve warm, sprinkled with icing sugar, cut up into squares.

2

Nutritional value

This characteristic Hungarian dessert, made with pasta (angel hair) is wisely mixed with other ingredients typically used to prepare sweets, such as sugar and eggs, or very local ones, such as sweet ricotta and sour cream. The final result

is a substantial dessert with a high level of calories, carbohydrates, and fat, fair in proteins content and certainly tasty, also due to the notes of vanilla. Cut into small squares it can be consumed without overdoing it.

Bain taithneamh agus sult as

Ireland

The island of Ireland lies at the wind- and wave-swept western edge of Europe, where warm Atlantic rain and a diverse geology combine to create high-quality agricultural produce and, of course, pure water for a drop of the 'black stuff'. But Ireland's proximity to oceanic margins extends back over time, leading to a long and complex geological history and range of rocks and landscapes.

Ireland is often described as 'saucer-shaped', with the uplands around the edge enclosing a flat-lying area in the middle. The combination of bedrock and Quaternary geology, its influence on topography and soil development, and climatic variations across the island of Ireland, influence different land uses and agriculture type.

Upland areas underlain by very poorly transmissive rocks such as igneous rocks, Old Red Sandstones, Namurian sandstones and mudstones, and Precambrian metamorphic rocks, as well as areas with thin soil horizons underlain by very well-drained karstified limestone and extensive gravels, tend to be occupied by sheep farms. Lamb or mutton is an essential component of Irish Stew. Ewe's milk is also turned into specialist cheeses such as Creeny (County Clare), Knockalara (Waterford), Millhouse (Offaly) and Knockdinna (Kilkenny).

Dairy and beef farming takes place across much of Ireland, typically in the flat-lying Midlands, which are underlain by shelf and basinal limestones, on hillsides and in valleys of the 'Southern Synclines', where Old Red Sandstone and Carboniferous strata have been folded during the Variscan Orogeny, and in the North, where sub-glacial drumlin landforms resembling an upside-down eggbox are carefully drained to give lush pastures. Both industries are economically important, with mass-produced and artisanal cheeses produced from dairy products, and beef produced for domestic consumption and export.

Potatoes are also an intrinsic component of Irish Stew and although potatoes were a subsistence crop in Ireland for centuries and grown everywhere, potatoes are commercially grown mainly in the east and southeast of the country. Here, the gently rolling lowland landscape with large fields, well-drained soils derived from Ordovician and Silurian greywackes, and a generally warmer and drier climate than the west combine to create optimal conditions for growing crops of all types, including wheat, corn, and barley.

Although tea is probably the most popular drink in Ireland, followed closely by coffee, to accompany a meal, or to drink on their own, stout – a dark, black ale (most famously brewed by Guinness), beer and cider are produced – and drunk – in Ireland. The vast majority of production is undertaken at a commercial scale and exported around the world. There is also, however, a burgeoning craft beer movement, with small-scale breweries producing bespoke ales, beers, lagers and stouts. Whiskey is produced at several distilleries across Ireland. Stouts, beers and whiskeys are predominantly made of wheat, barley, hops and water. The character of some whiskeys depends on the peaty signature of the water used in their production.



Brian McConnell (left) Head of Bedrock Programme, specialising in the Lower Palaeozoic, has responsibility for mapping, Carbon Capture and Storage, and aspects of Geohazard mapping.

Taly Hunter Williams (right) EGS National Delegate and Senior Hydrogeologist working in Groundwater Programme, and with oversight of other Programme areas.



Irish stew

1

- Remove the meat from the bone, trim off all the fat and cut into cubes. Keep the bones, place the meat in a pot, cover with cold salted water. Bring to the boil, drain and rinse the lamb.
- In a fresh pot, put the meat, bones, bouquet of herbs, onions, seasoning, carrots, leeks and turnip and cover with water. Simmer gently for one hour.

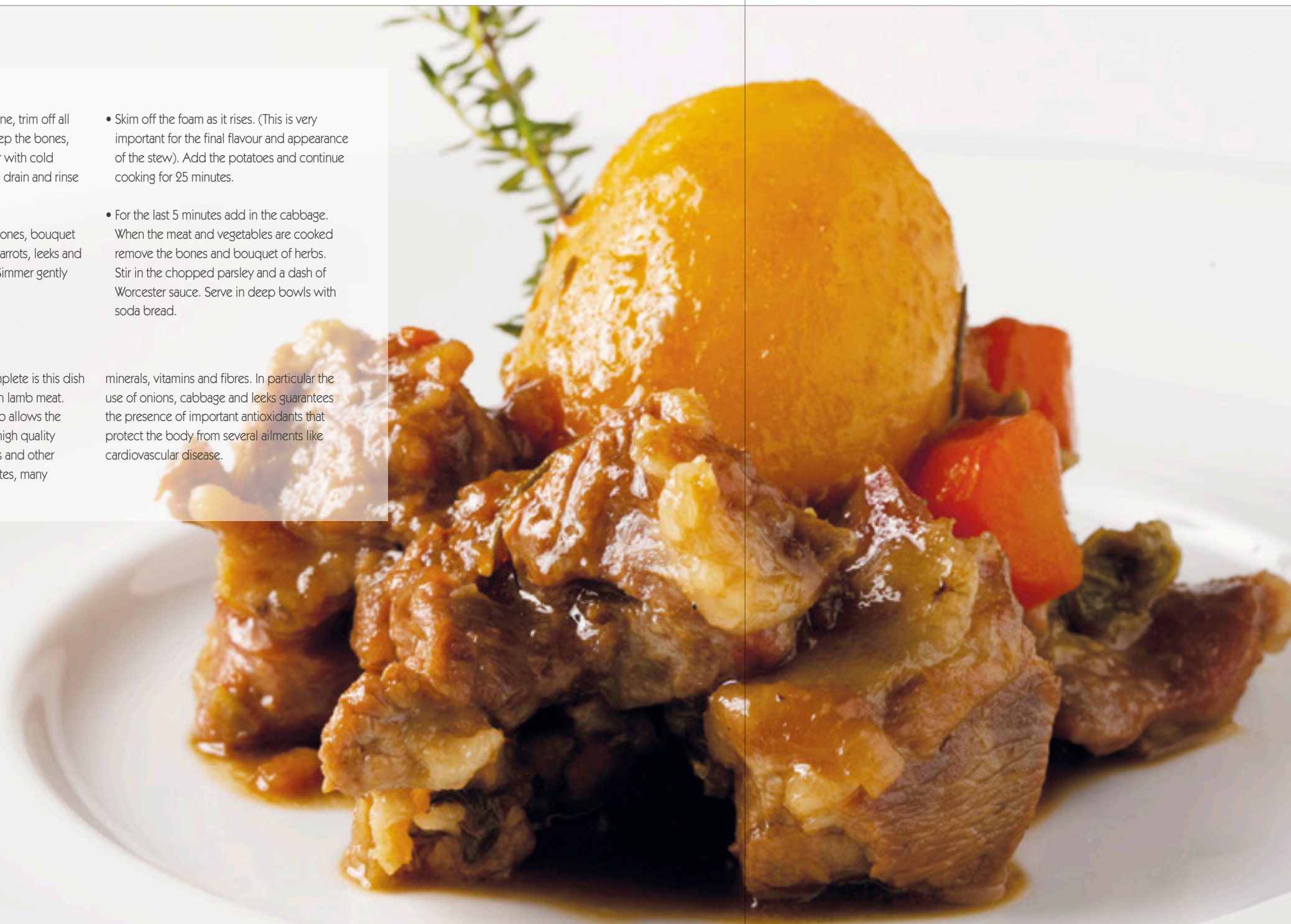
2

Nutritional value

Simple, tasty, light and complete is this dish prepared with the excellent Irish lamb meat. The cooking process of the lamb allows the meat to lose its fat providing a high quality protein base while the potatoes and other vegetables provide carbohydrates, many

- Skim off the foam as it rises. (This is very important for the final flavour and appearance of the stew). Add the potatoes and continue cooking for 25 minutes.
- For the last 5 minutes add in the cabbage. When the meat and vegetables are cooked remove the bones and bouquet of herbs. Stir in the chopped parsley and a dash of Worcester sauce. Serve in deep bowls with soda bread.

minerals, vitamins and fibres. In particular the use of onions, cabbage and leeks guarantees the presence of important antioxidants that protect the body from several ailments like cardiovascular disease.



- 1-1½ kg neck or shoulder of lamb
- Bouquet of parsley, thyme and bayleaf (tied together with twine)
- 3 large onions, finely chopped
- Salt and freshly ground black pepper
- 3-4 carrots, chopped into bite-sized pieces
- 1 small turnip, chopped into bite-sized pieces
- Some small new potatoes, peeled and quartered, or large potatoes, peeled and chopped
- 75-100g cabbage, shredded
- Finely chopped parsley and dash of Worcester Sauce

Buon appetito

Italy

The Italian Peninsula, for its geographical aspect, appears as a coherent territorial entity. However the Italian territory is very different; excluding the vast homogeneous fertile Po valley, the rest of the territory is divided into mountain chains and massifs, rivers and valleys. The largest Mediterranean islands, Sicily and Sardinia, belong to Italy.

Italy is a geologically young country, and the present shape is a result of the collision between the African and the Eurasian plate which, starting from the Late Cretaceous, caused the formation of the Alps, oriented EW, and the Apennines, developed in the longitudinal direction for the entire length of the country.

The Alpine chain is made up of calcareous sedimentary, igneous and metamorphic rocks; in the central-western Alps, the Dolomiti massif represents the remains of an ancient coral platform, with its peculiar forms perfectly preserved. At the foot of the Alps stretches the Po Valley, an ancient marine gulf filled by gravel, sand and clay sediments of marine and fluvial origin.

The Apennine ridge extends for about 1300 km, forming the backbone of the Italian peninsula; it is the most recent orogeny, that represents a later stage of the Alpine orogeny, as is evident by the intense seismic activity. From the Apennines springs several short rivers, carrying sediments eroded from the chain towards the sea, sometimes forming small plains.

Other plains are located in the Tyrrhenian area, related to post-orogenic extensional phases of the Apennine chain, and in the Adriatic sector, originated from shallow marine floor of the Apulian foreland raised in recent times.

The central-eastern Sicily consists of units belonging to the deformed African convergent margin («Maghrebids units»), while the north-western belong to the European units («Peloritani units»); between them are interposed «Sicilidi» and «Numidian» units that represent the sedimentary cover of the Tethys oceanic domain.

Sardinia deserves a separate discussion, in which rock outcrops of the Cambrian period are prevalent. The entire Sardinia-Corsica block, originally linked to the Southern margin of the European continent, detached from the mainland in Oligocene-Miocene epoch, turning counter-clockwise to collide with the African continental margin.

The marsh system, the buffalo and mozzarella cheese. Among the many geological and geomorphological environments that characterise the Italian peninsula, one of the most peculiar is the flood plain. As seen above, at the foot of the mountains are formed small plains fed by rivers, often of short length, descending from the Apennines. The Sele Plain (or Paestum Plain or Eboli Plain), in province of Salerno in the Campania Region, covers about 500 km² along the path of the Sele River: the most important cities are Battipaglia and Eboli. Until the mid 20th Century this area was marshy and malarial. However, after land reclamation and mosquito eradication, with thanks to the work of the American liberators, there has been an enormous development of agriculture and farming, especially buffaloes. This sedimentary environment is controlled primarily by fluvial dynamics and deposits carried by rivers composed

of clastic sediments (alluvium). During the flood of the rivers these areas can be totally or partially invaded by water. These phenomena lead to migration-related processes as the growth of the river side and vertical growth of the bed.

In this area different shapes and sedimentary environments can be recognized such as natural levees, side or center channel, broken fans, flood plains, ponds, marshes, etc. The presence of these environments has encouraged the breeding of the buffalo, particular to this area of Italy.

In addition to economic development linked to the production of mozzarella cheese, buffalo is credited with having made possible the use of wetland and marginal areas, often degraded, preventing the abandonment of man.

As a result of barbarian invasions vast territories, especially in southern Italy, had been abandoned and were therefore subject to a gradual swamping. The degradation of these areas, especially the Sele Plain, was described by famous writers who made their trips to Italy such as Goethe, in 1786, that for the Paestum plain reports: «In the morning we set out earlier and running through an awful road we came close to two beautiful mountains, after crossing several streams and rivers, where we saw buffaloes look like hippos with blood and wild eyes. The region grew as flat and barren: few hoven here and there denoted a wretched agriculture.» From the words of Goethe it is evident that the breeding of the buffalo was the only form of exploitation producing an income from this flat and marshy land.



Marco Pantaloni is Senior Researcher at the Geological Survey of Italy-ISPRA.

His research activities focuses on geological field survey, with special emphasis in mapping and stratigraphy, and in deep wells data elaboration. Coordinator for the national geological mapping

project for North-Eastern Italy and responsible for the Alpine chain geological Committee.

Friselle with mozzarella, fresh tuna and tomato jam

Friselle

Semolina 200g
Buckwheat 200g
Vergin yeast 200g
Virgin yeast 4g
Water 220g
Extra virgin olive oil 12g
Salt 7g

Tomato jam

Ripe tomatoes n4
Pectin 4g
Sugar 50g
Extra virgin olive oil, thyme
Basil to taste - Salt 7g

200 gr of smoked tuna



1 Friselle

- Mix the flour with both yeasts gradually while adding water, then oil, and finally the salt. Let it rest for 1 hour. Form of strings of 1 cm thick, wrap the dough in on itself creating small buns. Place them on a greased baking sheet and let it rest for 45 minutes. Afterwards bake them at 200°C for 8 minutes. Allow them to cool and cut the doughnuts in half in order to obtain two discs. After that bake them at 200°C for 4 minutes.

Tomato jam

- Bake the tomatoes with olive oil, salt and thyme at 150 ° C for about an hour.

2 Nutritional value

The green of the wild herbs and capers, the white mozzarella and the red of the tomatoes not only recalls the colours of the Italian flag but also expresses the typical Italian flavours and aromas. The dish is finished by the use of tuna which adds a taste from the sea surrounding almost the whole of Italy. And all is served on a 'frisella' bread made with ancient grains linked to the territory. Many of the

- Pass the tomatoes through a sieve and add 50g of sugar, 4g of pectin, 5g of salt, and basil leaves. Cook everything in a saucepan without letting it reach a boil. Afterwards allow it to cool.

Finally

Place the friselle in a dish, sprinkle with tomato water and place a slice of lightly smoked tuna and a slice of mozzarella di bufala on each piece. Decorate with a drop of tomato jam and dust of capers.

ingredienis that characterise the Mediterranean diet are present in this dish. The presence of the complex carbohydrates from buckwheat flour, which does not contain gluten, the light protein from the mozzarella and tuna, the minerals and the vitamins from the ripe tomatoes, which are also rich in powerful antioxidants such as lycopene. All of this makes for a complete dish with not too many calories.

Buon appetito

Emilia-Romagna (Italy)

The “borgotaro boletus”: a treasure from the Apennines

The Apennine ridge extends for about 1300 km, forming the backbone of the Italian peninsula. Along the border between Emilia-Romagna and Tuscany, in the area between the Provinces of Parma and Massa-Carrara, the landscape of the Apennines is very varied, summarising in itself many of the typical aspects of the Northern Apennines. This area, that coincides with the homeland of the “Borgotaro Boletus” - a treat for the palate -, is the birthplace of scientific studies that, since the 50's of the last century, led to the current geological reconstruction of the Apennines and a revolution of knowledge in the field of stratigraphy, structural geology and paleogeography. The considerable geological and morphological complexity of this area gives rise to a composite landscape defined by striking contrast.

Gentle, often cultivated slopes alternate with badland erosions (calanchi), with conspicuous cliffs which are darker in colour and formed by ophiolites, and imposing rock reliefs above, covered with thick forest. On the slope and valley floor, the rocky substrate is

mostly formed by Scaly Clays (Argille Scagliose): chaotic complexes in which the clay matrix incorporates various sizes of calcareous, arenaceous, marly and ophiolitic rocks. Inside them we find rocky complexes which, by virtue of their great resistance to erosion, form the peaks. These are both vast portions of Cretaceous-Paleocene Flysch (Mounts Gottero and Molinatico) and the Oligo-Miocene Epiligurian sandstone (Mount Barigazzo).

The Cretaceous-Paleocene Flysch deposits consist of compact alternating argillaceous-arenaceous and/or marly-calcareous layers, regularly stratified and, in some areas, characterised by complex system of folds, joints and faults. The stratification pattern is clearly visible in steep escarpation, being only slightly masked by the thick vegetation. The Epiligurian sandstone is stratified sandstone which creates a landscape defined by reliefs, often with tabular morphology or grags, bordered by wooded slope.

The rocks which make up this complex landscape formed between 175 and 20 million years ago (Middle-Upper Jurassic to Lower Miocene).

The geographical area of production

In 1996 the «Borgotaro Boletus» was with the designation I.G.P. (Protected Geographical Indication) by the European Commission. This mushroom grows in the woods that cover the rocky slopes of the Tuscan-Emilian Apennines in the municipalities of Borgo Val di Taro and Albareto (Parma Province) and Pontremoli (Massa-Carrara Province).

The woods of the I.G.P area are typical of the Apennines, with oak and chestnut trees in the lower altitudes and beech wood and artificial fir-wood in the higher end towards the ridge. The form of care and the type of treatment of these woods greatly influences the Boletus production as these conditions, in turn, create the microclimate of the undergrowth. The age-old silvicultural activities of forest owners, who treat these woods with passion and expertise, contribute positively to the growth of the Boletus, the most famous and prestigious in the world. For this reason this product should be considered as a «spontaneous product helped by man».



Maria Carla Centineo works for the Geological Seismic and Soil Survey (SGSS) of the Emilia-Romagna Region (Italy). Since 2003 she is involved in the programme of communication and dissemination of the knowledge acquired by SGSS in the fields of geology, soil, natural resources and risks within Emilia-Romagna.

Soup of “Borgotaro Boletus”

Serves 6 generously

8 ounces of small mushrooms
Toasted croutons
Onion, carrot, celery, 1 potato
Chopped dried mushrooms
Olive oil and butter
Beef broth,
1/2 pint of cream

1

- Clean the mushrooms, thinly slice the chapels and a part of the stems, grate the other party.
- Put oil in pan, butter and chopped onion, celery, carrots and dried mushrooms. Gently fry over moderate heat and then add the sliced mushrooms and grated with salt and bring to a gentle heat.

- Add broth and potatoes boiled and mashed.
- Keep boiling for a few minutes and add the cream.
- Serve with toasted croutons.

2

Nutritional value

This typical mushroom soup, very rich and hearty, contains a good proportion of all the major nutrients (carbohydrates, proteins and fats) and many minerals, vitamins and fiber, especially potassium, phosphorus, selenium

and copper, vitamin A and B, from the mushrooms and the vegetables used for the preparation. Moreover the use of onion, with its very significant sulfur molecules, acts as a detoxifying agent and protects from heart disease.

l-ikla t-tajba

Malta

The beautiful Islands of Malta have long held a place in the imagination. When viewed from afar, they appear on the horizon, as gently wind-eroded golden cliffs. Although the highest point is only 253 meters above sea level, the topography carves into undulating valleys and forested peaks. Being a territory of approximately 316 km², with a population of fewer than half a million inhabitants, the islands burgeon to even fuller capacity during the peak tourist months. It is fortunate therefore that the Geology of Malta has resulted in the formation of four islets, which comprise of several secluded bays and deserted coastlines, which the inhabitant and visitor alike may enjoy.

The geology of the Maltese Islands is recent when considered within the geological time frame. The oldest outcrops date back to the Tertiary period, during the Oligocene and Miocene periods.

The Islands are composed of marine sedimentary rocks, although the sedimentary platform on which the Maltese Islands are situated was formed during the Triassic, as an extension to the African tectonic plate. Quaternary deposits are found in minor quantities and are of terrestrial origin. The simple sedimentary sequence illustrates an interesting structural framework, and gives an insight into the regional tectonic stress/strain framework of the area. From the fossils found in these sedimentary rocks, the age of the sequence

ranges from within the Chattian Stage of the Late Oligocene epoch to the beginning of the Messinian Stage of the Late Miocene epoch. The Islands preserve some of the most delicate reef structures in situ, and are known for the Echinoderm Scutella beds.

The lithological Sequence forming our Islands document a history of sea level change. Over the time period from the Chattian to the Messinian, global sea level began almost 200 metres above present levels, fell to around 50 metres then rose to almost 140 metres higher than today before falling sharply back. The water depth changes are reflected in the Maltese rock sequence.

The Lower Coralline Limestone comprises sediments deposited in shallow sunlit water only a few tens of metres deep. The Lower Globigerina Limestone, consists of yellow to pale-grey limestones, formed from the tests of planktonic Globigerinid Foraminifera. The Formation is divided into Lower, Middle and Upper Globigerina Limestone by two beds of phosphorite pebbles. These intervening horizons represent short periods of tectonic uplift and sea-level fall.

A change to deeper water is seen in the deposition of the Blue Clay Formation. Such sediments show a dominance of fossils from the marine plankton without any evidence of wave action, indicating a paleodepositional environment in water depths

of c. 100 metres or more. It is composed of abundant clay minerals transported from the then rising mountains in Sicily. The Clay also includes the tests of coralline algae such as Calcareous Nannofossils, which can be examined in high diversities and abundances in well preserved states.

By contrast, the change to the Greensand and Upper Coralline Limestone is a sign of a rapid shallowing back to wave-agitated sun-lit water. The Greensand Formation consists of bioclastic limestones rich in glauconite deposited in a warm sea. The transition from the underlying Greensands to the Upper Coralline Limestone is gradual, sometimes merging into red and black granular sandstone; or red and white coralline rich limestone, which passes into a white calcareous sandstone-compact, soft or porous but always rich in organic remains. Though some layers are completely crystalline and have lost traces of the organisms from which they originated, other portions are highly fossiliferous containing casts of shells and other organisms.

The lack of any further widespread sedimentation in the Maltese Islands after the Upper Coralline Limestone is evidence that relative sea-level dropped further still as the north-eastern flank of the Pantelleria Rift rose to expose the submerged area of land as the Islands we know and love today.



Julie-Ann Auerbach is born in County Cork, Ireland. She graduated in Earth Sciences (majoring in Geology) from University College Cork (1999). She furthered her education by completing a MSc. In Geophysics in the University of Malta in 2003. She is currently undertaking an MPhil in Paleoclimatic Science in the analysis of

Microfossils (Calcareous Nannofossils), from University College London. Since 1999 she has worked within the Geological Section of the Government of Malta. Her main interests lie in appreciating the natural environment around her and enjoying her profession.



1

The Widow's Soup recipe has seasonal variations of ingredients as this typical Maltese soup was made out of ingredients that the widow – who would have lost her husband and thus the bread winner of the household – would have received from neighbours as a form of social assistance in the early days of bereavement. This recipe is from the late 19th century due to the ingredients used.

- Heat a deep pot with a good glug of Maltese olive oil, add the onion and the garlic and sauté until transparent. Add the chopped vegetables, one at a time, and stir constantly to avoid the vegetables from sticking to the pot. When the vegetables start to slightly change colour add enough water to cover.

2

Nutritional value

This typical Maltese soup is a little treasure of nutrients, vitamins, minerals and fiber. The quantity and variety of vegetables used guarantee the substantial presence of minerals such as potassium, magnesium, zinc and iron, vitamins (vitamin A, vitamin K and B group) and substances containing sulphur, which provide a detoxification effect: onions,

- Simmer until all the vegetables are tender. Season with salt and pepper accordingly. Add the gbejniet and also poach the eggs in the soup five minutes before serving.

- Serve 1 gbejna and 1 egg per portion together with the vegetable soup in a deep plate.

This recipe was compiled by the Institute of Tourism Travel and Culture, of the University of Malta by visiting lecturer Paulino Schembri MSc., Adv. Dip in Culinary Arts, Reference: "Limestone Isles in a Crystal Sea, The Geology of the Maltese Islands" M.Pedley; M.Hughes-Clarke, and P. Galea, 2002.

cabbage, cauliflower and kohlrabi. It could be considered a complete meal thanks to the presence of carbohydrates in the potatoes and vegetal proteins in the legumes and animal proteins in the eggs. It is also worth mentioning the vitamin D content of the excellent «gbejniet», which is a typical Maltese cheese

Soppa tal-Armla

Widow's Soup

- 2 onions, chopped
- 2 cloves garlic, crushed and chopped
- 2 potatoes, peeled and chopped
- 2 carrots, peeled and chopped
- 1 kohlrabi, peeled and chopped
- 2 celery stalks, chopped
- A quarter of a small cabbage, roughly chopped
- A quarter of a small cauliflower, roughly chopped
- 1 cup peas/broad beans, (optional) when in season
- 4 Gbejniet (fresh Maltese sheep cheeselets, 1 per person),
- 4 Eggs (1 per person)
- Water enough to cover the vegetables
- Salt & pepper

Eet smakelijk

Netherlands

Geologically and morphologically, the Netherlands is probably best known for its fluvial and coastal lowlands. These depositional environments make for excellent arability, and the country has a very high agricultural production. The southwestern province of Zeeland ('sea-land'), with its strongly indented estuarine coastline is especially well-known for its fishing and shellfish industries.

The Oosterschelde estuary is home to the Oosterschelde lobster, a local variant of the European lobster (*Hommarus gammarus*) that some consider the best-tasting in the world. European lobsters generally do not tolerate low salinity and low temperatures, and a population was only able to establish itself in the Oosterschelde after engineers closed the connection with the river Scheldt in the 1868, diverting the outflow through the Westerschelde.

In this way, salinity became more favourable for lobsters, but even so the population was repeatedly decimated, due to particularly severe winters, and more recently also to new fresh water influxes associated with the construction of the world-famous delta works, during the second half of the previous century. After each decimation, the population was rebuilt from the strongest surviving specimens.

As a result of this strong genetic selection, the population developed a recognisable own DNA structure and certain endemic characteristics, amongst which its delicate taste and structure.

Armourstone, groynes and piers in the Oosterschelde make a good habitat for lobsters, which you would normally expect living on a rocky substrate. Their population is carefully managed, and fishing is a sustainable, low-impact, artisanal operation. The fishing season lasts from April 1 to July 15.

Oosterschelde lobsters are bluish-black, and are generally sold at between 500 and 1000 grams (but bigger specimens do occur). They do not need complicated preparation and are best served as a soup (e.g. a bisque), or boiled. We suggest the latter, with hollandaise sauce, accompanied by blanched samphire, boiled potatoes and a lettuce vinaigrette salad. Samphire (*Salicornia*), a sea vegetable, is just as characteristic of Zeeland's regional cuisine as the main ingredient. A lighter white burgundy (Côte de Beaune or Mâconnais) is probably the best wine accompaniment.



As chief geologist of the Geological Survey of the Netherlands, **Michiel van der Meulen** is responsible for the delivery of 3D models of the Dutch subsurface. When on field trips, he always makes sure to not only sample rocks but also the local cuisine.

1

Hollandaise sauce

- Melt 200 grams of good quality unsalted butter, clarify and then allow to cool down to just above the melting point.
- Mix 2 or 3 egg yolks with a good squeeze of lemon juice. Optionally you can add some fine-ground mustard (if no Dutch mustard is available, Dijon will do just fine).
- Slowly pour in the melted butter while whisking gently: the butter will emulsify. If the butter is too hot, the eggs will scramble and you will have to start all over again. Separation of the mixture can be resolved by adding a little bit of warm water and whisking.
- For a thinner consistency add some warm water.
- Season to taste with salt and pepper or cayenne pepper.
- Keep warm until serving, preferably au bain-marie.
- For a lighter, more delicate sauce fold in some whipped cream (which turns your hollandaise sauce into a mousseline sauce). Do this just before serving. Adjust the seasoning.

Boiled lobster

- A typical Oosterschelde lobster of about 750 grams needs to be boiled for about 8 minutes. One such lobster serves one or two, depending on your appetite.

2

Nutritional value

The boiled lobster meat in this simple but hearty, typical Dutch meal is lean and rich in proteins. It combines well with the robustness of the hollandaise sauce, characterized by the eggs and fat from the butter. The main nutrients in this dish are carbohydrates from the potatoes. Lobster meat provides a good dose of minerals such as phosphorus, potassium,

- Put the lobster head-down in well-salted boiling water with a squeeze of lemon juice, or alternatively use a well-seasoned court bouillon. Make sure your pot is large enough to completely submerge the lobster.
- Remove the lobster from the water, let it rest for a couple of minutes. Then cut in half, remove the intestinal canal (and other un-pleasantities that may bother you), crack the claws and serve with the hollandaise sauce and a slice of lemon. Make sure to provide your guests with a lobster pick.

Accompaniments

- For the boiled potatoes, the best option would be a local variety such as Koopman's Blauwe. Unfortunately, these are hard to get by even in the Netherlands. Just make sure you use a high quality, preferably non-floury type.
- Samphire is naturally salty and gets slimy when overcooked: blanch briefly in unsalted water.
- For the salad: dress green lettuce with a vinaigrette (sunflower oil, white-wine vinegar, mustard, salt and pepper), add chopped pickled gherkin and shallot.

calcium and selenium. Samphire is rich in vitamins (A, C, B2 and B15), amino acids and minerals such as iron, calcium and magnesium. The salad provides additional vitamins, minerals, phytonutrients and fibre, and it complements the sweetness of the lobster, the velvetiness of the sauce and the saltiness of the samphire with acidity and crunchy textures.

Oosterschelde lobster with Hollandaise Sauce



Velbekomme

Norway

Many parts of Norway are noted for having lush outfield grazing for sheep and cattle. Nutritious vegetation on calcareous bedrock, enjoying regular rainfall, ensures that the livestock stay in good health and produce delicious food.

When the snow on the mountains melts as summer advances, sheep and other grazing livestock always have a plentiful supply of fresh food. The slaughtered animals are in an excellent state, and the farms supply tasty, delicious food.

One example is Gammeldalen, a small rural area far inland in Tynset, in the northern part of the county of Hedmark. The bedrock here predominantly consists of phyllite and mica schist, both of which are rich in calcite, a valuable source of nutrients for plants. Large parts of the area have a thick cover of unconsolidated deposits, and glacio-fluvial deposits dominate on the valley floor.

Much of the valley floor, which is located between 550 and 650 metres above sea level, consists of cultivated land, pastures, grassy woodland and many attractive transhumance dairy farms. There are also several large calcareous mires. The lush grazing is very nutritious, and the farms are actively worked.



Gudmund Løvø, Team leader
Communication. Of current interest: Responsible for the survey's public outreach activity in the Government initiative program Mineral Resources in Northern Norway (MINN) 2011-2014.



Braised leg of lamb

1

- Brown the meat in oil in a large iron pot with a lid, or in a meat tin in the oven at 250 °C for 8-10 minutes. Turn the meat while browning.
 - Season the meat afterwards with salt and pepper. Add the garlic cloves, cut into halves, coarsely chopped onions, carrots and herbs. Pour in the wine and stock.
 - Braise the meat, covered with a lid, in the oven at 150 °C for 6-7 hours. Turn it over regularly from the start and make sure there is always enough moisture to prevent it getting dry. Add water if necessary. Let the meat rest for 20 minutes before carving it.
- To serve**
- Carve the leg of lamb into slices – it's so tender it almost falls apart when you look closely at it.
 - Arrange the meat in large, deep plates with mashed potatoes, preferably creamed with a little olive oil and chopped parsley.
 - Fresh pasta is also ideal with this rustic autumnal dish.

2

Nutritional value

The Norwegian version of this is classical dish is distinguished by the high quality of the meat and its organoleptic properties. In fact, the Norwegian soil is full of nutrients and guarantees that the meat of the lamb becomes very delicate and particularly rich in noble proteins, vitamins and minerals. The extremely slow

cooking allows this wonderful meat to become even more tasty thanks also to the herbs and vegetables. The end result is a very delicate dish rich in protein but not too fat that becomes complete when combined with carbohydrates coming from the mashed potatoes.

Six persons

- 2 1/2 kg leg of lamb
- 3 tablespoons of olive oil
- Salt and pepper
- 1 garlic bulb
- 3 carrots - 2 onions
- 2 rosemary sprigs
- 10 thyme sprigs
- 6 dl flat-leaf parsley
- 1 dl red wine
- 4 dl veal stock

Smaczne go

Poland

Poland lies in Central Europe in the drainage basins of the Vistula and Oder rivers, in the Lowland zone, between the Baltic Sea in the north and the Sudety and Carpathian Mountains in the south. It is predominantly a lowland country as about 92% of its area lies below 300 m above sea level and the share of uplands and typical mountain areas is limited to about 8%.

However, true plains are mainly found in central Poland whereas the remaining areas are rather hilly and post-glacial lakes in northern Poland are more numerous than in any country in Europe except for Finland. This is due to the activity of continental glaciers in the Quaternary times. The moraine landscape of central and northern Poland contains soils made up mostly of sand and glacial till. In result, the bedrock is buried under thick cover of glacial deposits.

When we go beneath that thick cover of Quaternary deposits, Paleogene and Neogene sequences and Permian-Cretaceous infill of the Polish Basin, the geological structure appears so diversified and complex that it still remains a great challenge for European geology. The basement belongs to two higher-rank geological units: Precambrian East

European Platform in the north-eastern and eastern parts of country, and the Paleozoic West European Platform in the north-western and western parts.

A system of NW-SE oriented deep crustal fractures known as the Teisseyre-Tornquist Zone or suture marks the boundary between these units. Depocenters of the Permian-Cretaceous Polish Basin as well as axes of inversion of its sedimentary infill from the turn of the Cretaceous and early Paleogene are following the course of that boundary. The areas stretching south-west of the East European Platform are formed of fault-bounded blocks fairly freely moving up and down like piano keys throughout the Permo-Mesozoic and thereafter, forming the so-called Central European Block Mosaic.

Basement parts of these blocks display effects of Caledonian and / or Variscan orogenic events, hardly discernible in the East European Platform. The south of the country is dominated by highlands and mountain ranges. Alpine orogenic movements formed the Carpathian Mountains and the Foredeep. The climate is here moderate i.e., intermediate between maritime and continental ones.

Therefore, Poland frequently finds itself in the zone of atmospheric fronts and the weather is highly changeable. This may be especially tough time for someone who has to carry out field works in the autumn or spring and the weather turns to miserable, extremely cold, windy and wet. When this is the case, traditional Polish kitchen comes with some help as well checked treatment for those exposed to cold aggravated by wet and wind.

'First aid' for those exposed to cold aggravated by wet and wind was traditionally Polish beer soup with sour cream – Polewka pívna - a great way to warm up on a cold day and, when served cold, a terrific way to beat the dog days of summer. Comparative studies of this Polish meal and other European classics such as Belgian beer soup, German Biersuppe, Old Bohemian beer soup with bread from the Pilsen region as well as cheddar ale soup from New England or Wisconsin native's beer cheese soup regarded as 'the pride of the Midwest' are strongly recommended.



Dr Wojciech Brochwicz-Lewinski (left) - geologist specialising mainly in tectonics, stratigraphy and environmental protection. In 2008 he came back to the PGI-NRI International Cooperation Dept. to use experience gained in work for the government administration and international assistance programs.

Ilona Smietanska (center) - geologist, graduated from the Warsaw University. Since 1991 she is committed herself in international cooperation related activities of the PGI-NRI. She is a member of the EuroGeoSurveys National Delegate Forum.

Prof. Marek Graniczny (right) - the Polish Geological Institute-National Research Institute (PGI-NRI) staff member since 1971, a specialist in applying remote sensing methods to tectonic analysis, geohazard studies and mineral perspectives. At present, Chair of the EuroGeoSurveys International Cooperation and Development Task Force.



Polish beer soup with sour cream

Polewka piwna ze śmietaną

1

- Bring beer to a boil under cover with pieces of rye bread crusts and remove from heat.
- In a medium bowl, combine sour cream, egg yolks, 1 tablespoon of cold beer and icing sugar until smooth.
- Transfer slowly to hot beer, whisking. Heat just to the boiling point (but do not boil!).
- Remove from heat and add a pinch of cinnamon and stir.
- Portion into heated bowls and garnish with pieces of toasts and white dry cheese, if desired.

2

Nutritional value

According to tradition, Polish beer soup is an unsurpassed remedy for warmth in cold weather if served hot. It is also great to go through the very high summer temperatures if served cold. It is, in fact, filled with both nutritious ingredients and lots of calories from the sour cream and the egg yolks, and refreshing and minerals rich ones from the beer. The rye bread provides «ready to use» carbohydrates to regain energy. Topped with cinnamon

is the final touch that completes the dish. This, besides giving it a characteristic spicy scent, acts as an antiseptic-inflammatory substance. Mulled beer is also an excellent remedy against the cold in which you can find the «vasodilatory» action in the mix of ingredients containing alcohol (wine, beer, rum). This mix is what causes the feeling of «internal heat». The cloves of the beer provide anti-inflammatory properties.

6 servings

1 litres beer
1 glass of sour cream
4 large egg yolks
1 tablespoons icing sugar
Rye bread crusts for garnish
Toasts
Farmer's (dry) cheese for garnish (optional)
Pinch cinnamon

Bom apetite

Portugal

The Cozido (stew) das Furnas is a famous dish of the island of Sao Miguel (Azores Archipelago) that uses the Island's geothermal heat as a pressure cooker and for seasoning. Furnas is the easternmost of the three active central volcanoes on São Miguel Island. It corresponds to a polygenetic volcano with a caldera, partly occupied by the Furnas Lake. Inside the caldera numerous cones of pumice, maars (sl) and lava domes, can be observed.

The central depression of the Furnas Volcano results from the adjoining of two calderas, created in the course of major eruptions. This volcano is about 100,000 years old and is characterised by alternating volcaniclastic deposits, pyroclastic and lava flows, produced during collapse and refilling episodes involving a wide range of eruptive styles. In the last 5000 years there were at least 10 intracrater explosive trachytic eruptions. The most recent eruptive activity is represented by the historical phreatomagmatic eruptions of 1439-43 (Pico do Gaspar) and 1630 characterized by extrusion of a trachytic dome in its final phase.

Furnas volcano displays an extensive area of degassing with four main fumarolic fields, and various cold and thermal mineral springs, reflecting the hydrothermal system that underlies it. Inside the caldera are the fumarolic fields of Lagoa das Furnas, and in the southern flank of the volcano stands out the group of fumaroles of Ribeira Quente.



Rita Caldeira has a BSc in Geology and a PhD in Geochemistry (2006), by the University of Lisbon. She is a researcher at the Geology and Geologic Mapping Unit of the National Laboratory for Geology and Energy – LNEG.



Cozido das Furnas

A head of cabbage
Cubed beef, cubed chicken, cubed pork, chorizo
Chopped potatoes, sliced carrots
Rice
Salt - pepper - garlic powder - oregano
You will also need a large metal pot
and a length of rope.

1

- Chop the meat, including chicken, to large pieces and the chorizo and bacon on regular bits. Peel the potatoes and cut some while leaving others whole.
- Cut the carrots in half lengthwise. Cut the turnips and cabbage in quarters. Open the peppers in half (these are optional). Introduce all the ingredients in alternate layers in a pan made of aluminum. The last layer is sprinkled with salt.
- Cover up everything with cabbage leaves and cover the pan with its lid tied to the wings of the pan. Put up the pot in a bag, which

is in turn tied to a long length of rope (about three feet) that can be used to lift the pot, without causing it to tip over. Leave it among the fumaroles where holes have been dug and sealed with wooden covers, leaving the rope out.

- Once it's underground, the stew cooks itself after the appropriate amount of time (six to seven hours or more hours).
- Withdraw the pot from the natural boiler, take off the cabbage leaves that were smothering the stew (do not eat them) and serve up the vegetables and meat on different plates.

2

Nutritional value

This dish, prepared in a very original way exploiting the typical fumarolic fields, could be considered by a nutritional point of view very complete. The various types of meat guarantee the presence of proteins with high biological value, of minerals such as iron, and of many B vitamins, while potatoes and rice provide

carbohydrates and the vegetables used provide fibres, minerals (high doses of potassium and magnesium) and vitamins. The presence of sulphur molecules contained especially in the turnip and cabbage act as a detoxifying agent for the body and balance content of the dish.

Dobro rá- chut'

Slovak Republic

Slovakia is a small country in the heart of Europe. Despite its size, Slovakia is home to many Medieval castles, pristine mountain lakes, healing hot springs, caves, and in the last but not least, friendly people. The territory of Slovakia (49 035 km²) belongs to those interesting regions of Europe, where you can see the beauties of high mountains, piedmont, semi-steppe and steppe. The region is rich in deep-incised valleys, torrents, dense woods, mountain meadows and vast planes. It is either the country of meadows, peat bogs and superb underground spaces. The quaintness of the rocky formations scattered within entire area impressively characterise the geological history of this striking country and each of its regions. Manifold natural beauties, their seasonal variability and attractiveness, a lot of cultural-historical monuments, exquisite opportunities to tourism and recreation connected with heartiness and vivid folk tradition, are typical for this region.

The geological setting of Slovakia is rather complicated. Its territory is occupied by the Alpine mountain belt which one part are the Carpathians. It is remarkable mountain range with high-mountain impression whereby enrich the morphological variety of the Central, Eastern and a part of the Southern Europe. One of the segments of impressive mountain range represents the Western Carpathians, dominantly occurred in the territory of Slovakia.

The Western Carpathians are generally divided into the Externides and the Internides. The Externides, also called Outer Western Carpathians, are represented by Molasse sediments of the Carpathian Foredeep (Late Tertiary), numerous thrust units of the siliciclastic Flysch Belt (dominantly Paleogene) and tectonically complicated Klippen Belt (dominantly Jurassic and Cretaceous). The Internides are represented by the units of the Central (CWC) and Inner (IWC) Western Carpathians. The CWC consist of the following units: the Tatricum, the Veporicum, the Fatricum and the Hronicum. The Tatricum and Veporicum units are represented by crystalline basement (metamorphic rocks) and Variscan granitoids. The Hronicum Unit is composed of carbonatic sediments, mostly.

The IWC are formed by the Gemicum, Meliaticum, Turnaicum, Sillicicum and Zemplinicum units. These units are composed of metasediments and metavolcanics, granites, platform carbonates, pelagic sediments, glaucophanites etc. Post-tectonic sediments and volcanic rocks of the CWC and the IWC include terrestrial and lacustrine sediments of Senonian age, the Paleogene sediments of marine to lacustrine character, the Miocene sediments with conglomerates, sandstones, claystone shales, clays and neovolcanic rocks of Middle Sarmatian to Pannonian age mostly represented by andesite stratovolcanoes.

The Quaternary sediments cover almost the entire territory in quite variable thicknesses. Their contact with the basement is of erosive and discordant character which is reflected in different lithology and petrography.

The area of Slovakia is characterised by very complicated geology, but is also very diverse in cuisine. There are specific meals for every part of the country from east to west and north to south. In the 19th century, Slovakia was a land of simple farmers, who had been working in the fields or grazing sheep in the mountains. Slovak cuisine originated from products that people cultivated on their fields and gardens, or from farmed animals. Potatoes, tomatoes, peppers and onions were the basis of many dishes along with chicken, pork and beef, to a lesser extent, mutton and lamb. The speciality is sheep cheese, or producing a variety of products such as sheep cheese called "bryndza" and the smoked sheep milk cheese "oštiepok".

Among the most famous Slovak specialities include typical Slovak sauerkraut soup «kapustnica»; the tastiest dish roast goose served with "lokše" – "lokshe" - potato pancakes and red cabbage. Among the traditional dishes are also «Živánska roast», «bryndzové halušky» – potato dumplings served with sheep cheese and bacon, «strapačky» – potato dumplings served with cabbage and bacon and excellent bean soup with smoked meet.



Branislav Žec (left) is Director of the State Geological Institute of Dionýz Štúr (SGIDS). He was worked at SGIDS like geologist focussed on regional geology and natural mineral deposits. From 1984 to 2011 he was coordinating a lot of projects and he is author and co-author more like 80 scientific publications. In 1984 was graduated in Technical University, Faculty BERG, Košice. Ph.D. obtained in 1988 from Slovak Academy of

Science (Bratislava). He is member of the Board of directors of the Slovak Mining Chambers and the Union of mining industry, metallurgy and geology.

Alena Klukanova (right) is Deputy Director of the State Geological Institute of Dionýz Štúr (SGIDS). She has been staff member since 1980 and acts as an expert in engineering geology, environmental geology and geohazard

studies. From 1980 to 2011 she was coordinating a lot of projects and she is author and co-author more like 800 scientific publications. In 1980 she was graduated in Comenius University, Faculty of Natural Science, Bratislava. In the same year she was acquire Doctor of Natural Sciences (RNDr.) and Ph.D. obtained in 1989 from the same University.



Roast goose, red cabbage and lokshe

(potato pancakes)

1 goose
1 apple - 1 onion
0,5 dcl oil - Salt

Cabbage

1 head red cabbage
Pinch of salt
1 onion
2 spoons oil - 1 spoon sugar
0,5 dcl vine or 1 small spoon vinegar

Lokshe

800 g jacket-boiled potatoes
200 g semi-coarse flour
1 egg - Salt
100 g goose lard

1

- Salt the goose both inside and out, and let rest overnight. The next day put an apple inside the goose and place in baking dish. Add a little water and roast very slowly (2 hours at minimum) until it turns soft.

- When done, remove the goose from the baking dish, leave to rest for a while, and carve. Serve with lokshe and stewed red cabbage.

- Cabbage: Remove the old outer leaves from the head of red cabbage and also remove the hard core. Then chop cabbage.

- Fry chopped onion in oil, add sugar and salt. Then add the chopped cabbage, add (season with) white wine or vinegar. Cook until soft.

- Meanwhile, make the lokshe. Peel the potatoes and press while still warm, when cold, add flour, egg, salt, and combine into dough on a board. Use a rolling pin to make thin pancakes about 25 cm in diameter, and cook on a griddle without any fat.

- Grease with goose liver while the pancakes are still hot.

2

Nutritional value

Sauerkraut used in abundance creates a lot of fiber, minerals and acts as a detoxifying agent within the body. It is very useful in controlling the intake of protein and fat of the goose.

In addition to the goose, the potatoes and flour in lokshe provide the right level of carbohydrates for this recipe.

Dobbertek

Slovenia

Slovenia occupies the territory of the still active boundary of the African and Eurasian plates and, respectively, three large geotectonic units – the Alps, the Dinarides and the Pannonian basin, resulting in great geologic diversity. This small country can take pride in diverse rocks and fossil remains preserving more than 500 million years of an almost uninterrupted record of geological history.

The Dovžan's gorge (Dovžanova soteska) can be regarded to be a symbolic representation of the cross-section through the geological past. This scenic valley in the northern Slovenia, sculptured through time by tectonic forces and differential erosion processes, exposes a section of fossil-rich Late Paleozoic rocks.

Especially due to a long history of paleontological studies it has become known worldwide. Besides fossils, Dovžan's gorge displays a palette of tectonic structures, geomorphologic features, sedimentary structures and weathering phenomena, one of which closely resembling the national dessert – OREHOVA POTICA.



Marko Komac, Ph.D (left)
His scientific background as geologist includes research in landslide processes, spatial statistics, remote sensing and GIS in various fields of geology. Altogether he published 291 bibliographic units, of which 27 papers in peer reviewed journals, 72 communications to scientific meetings,

a book, 3 scientific maps, and 12 chapters in books.

Matevž Novak, Ph.D (right)
Specialised in Late Paleozoic biostratigraphy, micropaleontology and sedimentology. Active in geological mapping and seismotectonic research, in geohazard

investigations and popularization of geological science at the Geological Survey of Slovenia.

With special thanks to **Ms. Nevenka Hočvar** for her personal additions to the recipe which makes it a real treat!



Potica

Walnut roll

600 g plain flour
30 g yeast
4 egg yolks (whites will come in handy with the filling)
3 decilitre lukewarm milk
120 g butter
1 teaspoon of salt
2 tablespoon of sugar
Fat (butter or oil) for the mould

Walnut filling

600-700 g grinded walnuts
1 – 2 tablespoon of honey
30 g sugar
White of 4 eggs
Grated lemon peel
Rum



- Prepare the dough in a warm room. Heat up the flour, sift it into a bowl and stir it together with a teaspoon of salt. Stir dissolved yeast together with a tablespoon of sugar, 2 spoons of flour and ½ decilitre lukewarm water or milk.

• Leave it in a warm place for about 10 minutes to rise. Make a hole in the middle of the flour; add whisked eggs, yeast, lukewarm melted butter and sugar, adding lukewarm milk while stirring. Beat the dough for 15 minutes or until the bubbles appear and the dough separates from the bowl. Certain types of flour may need more milk than others. Sprinkle some flour on the beaten dough, cover the dough with a cotton cloth and leave it in a warm place to rise – about 2 hours.

2 Nutritional value

This delicious national cake of Slovenia, orehova potica, resembles the typical sandstone from rock formations found in the Dovžan's gorge. The classic ingredients for the preparation of this cake include flour, milk, eggs, butter and sugar, while the real peculiarity is the filling that

Finalisation

- Roll out the dough until it is less than ½ cm thin (better less); spread it with the filling. Roll tightly; put it in a well-greased mould. The potica is then left to rise slowly, but not too much, because it will rise during the baking. You can put the whisked egg on the potica before the baking for a shiny look.
- Bake time is 50 minutes to one hour at 180° C. You can grease the potica after 40 minutes with milk to make it softer. When baked leave it in the mould to cool down for at least 15 minutes and then softly turn it over to the board.

can be based on nuts (walnuts or raisins) or coconut and chocolate. As in all dessert ingredients carbohydrates and fats prevail. They are enriched, in the case of Potica, by minerals contained in the nuts and chocolate (magnesium, potassium, copper and phosphorus).

iQue
aproveche!

Spain

Salt: an edible mineral with a spicy history

Salt is so intimately related with mankind because our body needs sodium in many chemical reactions. Sodium with chloride make up salt, thus we cannot survive without it. Our tears, blood and sweat taste of salt.

But obviously in our prehistory, humans did not know this, and all the salt they acquired came from eating the meat of the animals they ate. They probably noticed that the animals they were hunting gathered in certain places where they licked a white material.

It is thought that the need for salt eating developed in humans when civilisation changed from hunting nomadic populations to a stable sedentary agricultural society that lived mainly on vegetables and cereals and the proportion of meat in the diet was accordingly reduced.

Another salt use innovation was food preservation, because it inhibits the growth of bacteria, a use that it is thought to date back to the Sumerians time (3500 BC). Salt was used to preserve meat, fish and vegetables, and to create delicacies such as salted olives, which added variety to the diet. Ancient Egyptians used it also to mummify bodies.

Salt is in fact a relatively common mineral on the surface of the Earth and in some places solid salt masses outcrop in the surface and can be directly collected or mined, but also salty springs and lakes dry out to leave salt crystals that can be collected or finally salt can be extracted from sea water or underground supplies of salty water by boiling or leaving it to evaporate.

Salt making was an important economic activity in many areas of the world and buying and selling salt became one of the most important trading activities. By 6000 BC and maybe earlier, salt was exploited in northern China (lake Yuncheng, in the Shanxi province. The name of this place, given during the Yuan Dynasty, means "city of transportation(of salt)"). There is also evidence of salt exploitations near the Dead Sea before the Bronze age. Hallstatt (Austria) is known for its production of salt, dating back to prehistoric times (1400 BC), and gave its name to the Hallstatt culture. The Celtic community at Hallstatt exploited the salt mines in the area, which had been worked from time to time since the Neolithic period, from the eighth century to fifth century BC. Celts were pioneers in the culinary and preservative uses of salt, a knowledge that later passed to Romans.

In Austria, near the city of Salzburg (that means city of salt) there are very ancient salt mines in Hallein (meaning salt mine) now famous for the giant underground slides, some more than 107 meters long, used by later miners to descend into the bowels of the earth. This mines made a great contribution to the river salt trade in Europe using the Salzach river (literally "salt water"). One of the main salt producing regions in the UK in Roman times was Cheshire in North West England, where salt rock has been extracted in Northwich, Middlewich and Nantwich, since Roman times to today. Solar salt was being produced in the northern Yucatan peninsula by the Mayan civilisation about 1000 BC to AD 300 however, even earlier Mexican salt works were found in Oaxaca. The early Aztecs held power over their enemies by denying them access to salt.

Salt soon became a marketable commodity around the world. Maritime civilisation, such as the Phoenicians, engaged in an extensive salt trade throughout the Mediterranean, as they originally acquired salt fish from the Egyptians (a commercial relation that started around 2800 BC) in return for Lebanon cedar, glass, and the dye Tyrian purple. The Phoenicians traded Egyptian salt fish and salt from North Africa throughout their Mediterranean trade empire. Thus the trade of salt made the commodity an expensive item due to the work needed to extract it, but also the high cost of carrying it by river, by sea and overland and despite the existence of many known deposit and manufacturing technology, salt remained in short supply until modern times. The demand for salt went into overdrive thanks to the medieval Catholic Church. With its mortal prohibition of meat and all foods considered «hot» (sexually charged, that is) on religious, lean days -- which had expanded to include half the calendar -- the demand for fish was enormous.

Such economic importance and the salt scarcity was the reason why many rulers decided to impose heavy taxes in the salt trade. The first text that mentions a tax on salt is from the seventh century BC in China, this practices created a monopoly that lasted 300 years. Salt tax in China partly financed the construction of the Great Wall. Mongols use salt from immemorial times sourced from huge salt lakes. Salty tea is a traditional drink in the area. Venetians of Marco Polo's era parlayed a tax on salt into a monopoly that financed their navy and helped the city-state dominate world trade. An unjust and exploitative system of salt taxes in France, known as the gabelle, may well have played a big part in the origin of the French Revolution.

The gabelle, in addition to making a common, necessary product unduly expensive (a burden that naturally fell more heavily upon the poor than the upon the rich), required everyone older than 8 living in a certain region to purchase far more salt each year than he or she needed, violations of this tax law led to thousands of deaths and imprisonments. The tax wasn't abolished until 1946. Salt taxation is also behind the famous Mahatma Gandhi 386 km march to the sea «Dandi March» or «Salt Satyagraha», in which protesters made their own salt from the sea, which was illegal under British rule, as it avoided paying the «salt tax». This civil disobedience inspired millions of common people, and elevated the Indian independence movement from an elitist struggle to a national struggle. Gandhi was jailed, but the march was a tool that led to his ending British rule over India without striking a single blow.

Although it has been suggested, in reality no taxes were imposed on salt by the Roman Republic and Empire, they simply had the monopoly of the trade, controlling the prize increasing it to raise money for wars, lowering it to be sure that the poorest citizens could easily afford this important part of the diet. They were more worried about a steady supply of the material to their cities. By 500 BC, they built a specific road from the coastal salt beds of the port of Ostia (located at the mouth of the Tiber, 30 km west of Rome), which stretched along the flat coastal expanses and which were filled with brine at every tide, first to the city of Rome, then over the Apennines and ending in San Benedetto del Tronto in the Adriatic.

The road was called «Via Salaria» and the roman soldiers that protected the route received part of their pay in salt. This part was called «salarium argentum» (salt money), and this is the origin of the word salary, although some studies also point out that roman families had an ancient custom of giving a small pay to their slaves in the form of salt, and that this is more probable the origin of the world salary.

In Greece the exchange of salt by slaves was common and gave birth to the expression «its not worth its salt» meaning that it was not worth the salt the slave was paid. Salt was extensively used in Roman times as a condiment in their well known sausage called garum, manufactured in very diverse recipes around the Empire using several types of fishes (sardine, salmon, anchovy or herring) and entrails of tuna, all of which was left to sun marinade in summer, and frequently stirred, the resulting mass was filtered and the liquid (liquamen) used as a condiment. But salt had another main use as an antiseptic.

Romans used salt frequently in dishes with green vegetables, because they thought this could reduce the acid taste of some varieties: this is the origin of the world salad. Salt was also used in a drink called defrutum. In many roman markets many foodstuff was sold already salted (to roman taste). Romans also used salt in their wars to ruin fields as a revenge to avoid that they could be cultivated again.

Other notable examples of the extensive salt trade in Europe are the Alte Salzstrasse in Germany or the Route du Sel in France. In Africa, the Tuareg maintained routes through the Sahara desert, specifically for salt transport using salt caravans (Azalai), a route that has been active until recent times.

Ritual uses involving salt were common in many cultures, many related to the idea of purity or disinfection or a barrier against evil. Just as often (clearly because of its ability to preserve), salt has been seen as embodying permanence, longevity and loyalty. In Japan salt is spread over the stage in theatres before a performance, Jews and Muslims believe salt protects them from devil. In Scotland salt takes part in some funerary rituals. Sumo fighters use salt as purification before their fights. In France in the Middle Ages it was thought that a menstruating woman could stop fermentation processes and thus she was called «en salaison» (cured in salt). Salacious is from the Latin salax, meaning a man in love: literally, 'in the salted state'. In the Pyrenees salt is placed in brides and grooms pockets to avoid impotence. In Germany, brides' shoes were sprinkled with salt, and in Egypt celibate priests abstained from salt because it was thought to excite sexual desire.

Throughout much of history, salt influenced the conduct of wars, the fiscal policies of governments and even the inception of revolutions. When countries wanted to go to war, they raised taxes on salt. By the 1500s, salt was in such demand by civilisations that during the war beginning in 1568 between Spain and the Dutch, the Dutch were cut off from their supply of Spanish salt. During the American Civil War, Abraham Lincoln ordered southern ports, where foreign salt was imported in millions of tons annually, to be fiercely guarded by northern ships in order to starve the enemy of salt. History in the Americas is filled with salt wars. This trend continued until after the Civil War.

Until the 19th century, the most important use of salt was in food, though it was also used to treat leather, dye textiles and in making pottery. In the 19th century, chemists discovered ways of using salt to make a whole range of new chemicals. Manufacturers today claim there are more than 14,000 uses for salt.

This industrial demand for salt caused a growth in the industry and much more extensive deep mining and drilling of salt. Salt shortages effectively ended by the middle of the 19th century.

Today global salt production is around 290 Mt (with the USA and China accounting for 40% of the total production) but some studies indicate that this might grow quickly to 300 Mtpa by 2015. World continental resources of salt are practically unlimited, and the salt content in the oceans is virtually inexhaustible. Globally the chemical industry uses around 55% of all the salt produced, salt for highway de-icing accounted for another 40%, only 2% of the production is today used in food.

In summary, salt was, and still is, a remarkably important mineral for human kind although today its main use is not anymore as a condiment, but in spite of that, everybody will have a bit of salt at home to make our dishes and our life a bit more tasty.



Professor Manuel Regueiro

is BSc Geology, by the Complutense University of Madrid (1979).

Since 2005, he is Chief of External Affairs of the Geological Survey of Spain (IGME), although he has been working (and still works) the last 18 years as

a specialist on industrial minerals and rocks in the Industrial Minerals and Rocks Department of the Mineral Resources Division of the Spanish Geological Survey and as Associate Professor of the Department of Crystallography and Mineralogy of the School of Geology of the Complutense University of Madrid, where he lectures on subjects

such as Mining Geology in 5th course of Geology and Mineral Raw Materials in 1st course of Material Engineering.

Fish baked in salt



- 1 x 450g fish
- 1 kg coarse rock salt
- 3-4 fresh rosemary sprigs
- 1 Spoon of olive oil

1

- Scale and gut the fish (you can ask your fishmonger to do it for you).
- Pick a roasting tin, big enough to hold the fish and prepare it as follows: Fill a medium sized bowl with salt and slowly add a little bit of water. Mix salt and water until it has the consistency of the sand we use in the beach to built castles. Then spread a layer of salt over the roasting tin to a thickness of half a centimetre.
- Dry the scaled, gutted fish with kitchen paper. Stuff the body cavity with fresh rosemary sprigs.
- Lay the fish on the salt bed and cover it with the rest of the salt until the fish is completely covered with a layer of around one centimetre of salt.

- Preheat the oven to 200°C and then introduce the fish 25 minutes. After 20 minutes open the oven and knock the salt slightly, if it is already hard leave it for another 5 minutes and remove from oven.
- Break the salt crust with a palette knife and knock out the salt crust until the fish appears. Using a pastry brush, remove the salt crystals from the surface of the fish and from around the fish.
- Carefully remove the fish from the salt and place in a serving plate and serve in filets with drops of olive oil and lemon wedges.

Best fishes to use for this recipe : sea bass, bream, red bream, mullet, common pandora, gilthead sea bream.

2

Nutritional value

The simplicity and the few ingredients used in the preparation of some dishes often make a final product of extremely high taste as in the case of this recipe in which the cleaned fish is simply stuffed with rosemary and baked in salt. This dish is very light, tasty and easy to digest.

The cooking process in salt makes the proteins of the fish meat completely void of fat. This recipe is rich in many minerals, including sodium, potassium, calcium, phosphorus, iodine and is a very a good source of vitamin A.

Bon profit

Catalunya (Spain)

Catalunya is located at the north-eastern corner of the Iberian plate. To the North, the Pyrenees represents the union suture between the Iberian and the European plates and records the tectonic and sedimentary histories of both plate margins. To the south-east, the Catalan Mediterranean Mountain System records the opening of the Gulf of Valencia and the Gulf of Lyons during Neogene times.

In between both mountain chains, the Central Catalan Basin stores the sediments which preserve the record of the main events that took place during the building-up of the Pyrenees and the Catalan Mediterranean System. On these mountain ranges, as well as on the Central Catalan Basin and on the Neogene basin outcrop very diverse types of rocks (igneous, metamorphic and sedimentary) which record all the geological epochs, from Cambrian to Quaternary times. This rich geological diversity together with the mountain and Mediterranean climates allow to the Mediterranean people to enjoy a very rich diet.

The carquinyolis are a kind of dry cookies typical from Catalunya, the Balearic Islands, Valencia, Aragon, Occitane, Sicily and Tuscany (cantuccini). They look like small bread slices, which include almond sections inside. They can be both a dessert after a good lunch, or can be had at tea time. The combination of its ingredients makes of the carquinyolis a typical product of the Mediterranean cuisine.

The almond tree (*Prunus amygdalus*) is cultivated in Spain for more than 2,000 years, probably introduced by the Phoenicians and later spread by the Romans. Its culture was established initially in coastal areas, where it continues to dominate, but has also been introduced into the interior of the Iberian Peninsula and even in northern areas, where the climate is not so favorable. It is a very hardy, drought tolerant species, so it survives in quite complicated areas, but declining. Depending on the latitude and the altitude, flowering occurs in January or February, so its biggest problem is the earliness of flowering and fruiting, making it very sensitive to spring frosts.

Although this tree adapts well to poor, dry and rocky soils, it prefers light, loose, deep and sandy soils, but also vegetates in francs. It is one of the most resistant fruit trees to calcareous soils, but it is very sensitive to root asphyxia by drowning. It is also quite resistant to soil salinity.



Laura Serra i Vila (left) is born in Barcelona in 1982. She graduated in Geology in the University of Barcelona (2007). She holds a master on Geophysics (2008). Since 2007 she is working in the Institut Geologic de Catalunya on Geothermal Energy Resources and on Field Geology.

Dolores (Lola) Boquera Ferreiro (right) is born in Madrid in 1976. She graduated in Geology in the University of Madrid (2001). She worked for the industry in the fields of Engineering Geology. Since 2010 she is working in the Institut Geologic de Catalunya on Field Geology and Geological Mapping.

1

- Preheat the oven to 200 or 220 ° C and put the almonds to soak.
- Mix the egg with the sugar and beat with rods to the foam point.
- Add the grated lemon peel. Then, add gradually the flour mixed with yeast and slowly beat with the rods. It could seem that the dough does not accept such a meal, but eventually takes it all. If the rod does not mix well, try with a fork. Drain the almonds and add to the dough. Mix well.
- On a baking paper, make a bar of about six centimetres wide and three centimetres high. Sticks to the egg mixture and varnish.
- Put it into the oven and bake for 10-15 minutes, until slightly golden.
- Remove from oven and cut diagonally into slices of about eight millimetres thick using a serrated knife.
- Place the slices on the rack of the oven and leave for 5 minutes more to catch colour.
- Cool on a wire rack, and...
- The wine recommended for this dessert is a sweet wine, for instance a sweet sherry or a muscatel wine.

2

Nutritional value

These biscuits are characterised by a good caloric intake but are not too greasy. Flour, sugar, eggs and almonds, mixed in a wise combination, allow to obtain yield tasty biscuits very invigorating when the energy of carbohydrates are combined with the power of minerals

contained in almonds. As well as enjoying them at the end of a meal with a dessert wine, Carquinyolis can be consumed as energy snacks in between meals, especially if you need a mental boost.

Carquinyolis

Dry cookies with almonds

150 g of sweet, raw almonds
1 egg
100 g of sugar
175 g of flour (one can use a bit less to make the carquinyolis lighter)
One and a half spoon of baking powder
A bit of scratched lemon peel



Smaklig
måltid

Sweden

Falun Copper Mine

Was in operation for a millennium, from the 10th century to 1992. It produced as much as two thirds of Europe's copper needs in the 17th century.

There are no written accounts establishing exactly when mining operations at the Great Copper Mountain began. Archaeological and geological studies indicate, with uncertainty, that mining operations started sometime around year 1000.

In the 13th century nobles and foreign merchants from Lybeck had taken over from farmers, who initially were small-scale miners. The merchants transported and sold the copper in Europe, but also influenced the operations and developed the methods and technology used for mining. The first written document about the mine is from 1288. It records that, in exchange for an estate, the Bishop of Västerås acquired a 12.5% interest in the mine.

By the mid 14th century, the mine had grown into a vital national resource and a large part of the revenues for the Swedish state in the coming centuries would be from the mine. The contemporary King, Magnus IV of Sweden, visited the area personally and drafted a charter for mining operations, ensuring the financial interest of the sovereign.

During this time, the output from the mine was used to fund expansionary politics of Sweden during its great power era. The Privy Council of Sweden referred to the mine as the nation's treasury. The point of maximum production occurred in 1650, with over 3,000 tonnes of copper produced.

Production had intensified in the preceding decades, and by 1687 the rock was crisscrossed by numerous shafts and cave-ins were not unusual. On Midsummer's Day in late June 1687 the mine collapsed, forming Stora Stöten (the Great Pit). It was a miracle that no one was injured, because everyone was off work on that particular day. Mining continued until 1992.

Falun was Sweden's second-largest town in the 17th century and its copper production affected the economic, social and political situation throughout Europe. This is why the historic industrial landscape around Stora Kopparberget (the Great Copper Mountain) and Falun were inscribed on UNESCO's list of World Heritage sites in 2001.

The lifts and pumps at the copper mine in Falun were, during the 16th and 17th centuries before the introduction of steam engines, powered by oxen. When these oxen died from strain or old age, the skin was turned into leather ropes used in the mine, and some of the meat was turned into Falukorv sausages. This sausage is today common in Swedish dishes.



Lisbeth Hildebrand is working as a senior geologist (MSc) and regional manager at the Geological Survey of Sweden's Mineral Resource Information Office. She is active in the EuroGeosurveys Mineral Resources expert group and is also SGU's national delegate in the EuroGeosurveys.

SGU

Miner's sausage and mushroom bake

600 g Falu sausage
1 onion
200 g fresh mushrooms
1 bunch of parsley
Butter
1 boiled, cold potato
Tarragon, 1-2 tbsps.
1 egg yolk
10 ml grated mature cheese
Salt, ½ tsp. - white pepper, ¼ tsp.

1

- Set the oven to 200°C (400°F, gas mark 6).
- Peel and chop the onion. Chop up the mushrooms.
- Fry the chopped onion and mushrooms in a frying pan. Mash the cold potato and chop up the parsley. Stir these into the mixture together with the tarragon, egg yolk and grated cheese.
- Add salt and pepper to taste.
- Cut the sausage in half lengthways. Place the pieces in an oven-proof dish.
- Add the mushroom mixture on top of the sausage. Bake the dish in a moderately hot oven for 15 minutes until it is heated through.

2

Nutritional value

This dish, simple and complete, was originally a meal for Swedish miners. In fact the composition of the typical Falukorv sausage (beef and pork mixed with potato starch) guarantees the presence of proteins and carbohydrates

needed for the hard work of mining. In the modern recipe Falukorv is served together with potatoes and mushrooms that provide dietary fibres, B vitamins and minerals such as iron, copper, phosphorus and selenium.



En Guete

Buon
appetito

Bon
appétit

Bun
appetit

Switzerland

The Alps are one of the most important foundations of modern geology: Agassiz developed many fundamentals of glaciology in the areas of the massive glaciers in Switzerland. Through a remarkable joint effort among European geologists, the theory of geological nappes as a major element in the architecture of orogens was proved in this amazing mountain chain.

Until the 19th century, geologists thought that mountains and valleys formed because of the shrinking of the Earth (analog to an apple becoming old). Studies and interpretation of rock structures at the famous Glarus thrust caused heated discussions. In 1841, the brilliant scientist Arnold Escher showed the area of the Segnes Pass to his British colleague, Sir Roderick Impey Murchinson, who agreed with the interpretation that the structures are overthrusts. Nevertheless, Escher proposed a resourceful system of two recumbent folds, perhaps partly under the impression of the great German Neptunist, Leopold von Buch.


Albert Heim, the most famous Swiss geologist at this time, adopted and defended the theory of Escher later. However, in 1864, Marcel Bertrand, a French mining engineer who never visited the Glarus Alps, made a new, little known interpretation of Heim's cross-sections and descriptions. He showed that the structural puzzle can be solved with a single thrust from south to north. Since that time, many geologists have visited the outcrops of the Glarus thrust and continued research on structures and mechanisms of overthrusts.

Of course, geology is part of our landscape, which delighted many well-known people in the 19th century already, such as Johann Wolfgang von Goethe and even HM Queen Victoria. She travelled to Switzerland in 1868, looking for some diversion during her difficult time following the death of her husband, Prince Albert, end of 1861.

Nowadays Switzerland is a small but important industrialised country with a remarkable prosperity. But this has been the case for only a few decennials. Especially in many remote alpine valleys, the poverty was very serious up to the beginning of the last century and famines were relatively frequent. For the people living there, it was essential to use the gifts of nature. In the southern valleys of the cantons of Ticino and Grisons chestnut trees (*Castanea Sativa*) have been extremely important. It is said that three trees were enough for nourishing one adult person. Chestnuts were used for a variety of every-day dishes, simple or sometimes more luxurious.



Peter Hayoz is geologist and hydrogeologist CHGEOlcert, head of the Geological Information Centre and member of the Management Body of the Swiss Geological Survey (SGS). Editor of several geological maps and reports, Swiss Delegate at the EuroGeoSurveys, member of the EGS Geochemistry Expert Group (GEG), Swiss coordinator for the GEG and for the project Via Geoalpina, Swiss Delegate in the 1G-E, GIC and CGI Expert Groups.

 Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Office of Topography swisstopo
Swiss Geological Survey

Chestnut cake

Castagnaccio, Bregaglia / Grisons



300 g natural chestnut flour
150 ml water, or a little more
50 g pine nuts
50 g raisins
0.5 tea spoon rosemary, minced
0.5 tea spoon thyme, minced
1 tea spoon salt
4 table spoons sugar (or more as you like)
Some olive oil (~1 dl)
Shallow cake form

1

- Rinse the raisins for 20 minutes in hot water.
- Mix the chestnut flour with sugar, salt and herbs in a bowl.
- Add water and up to 3 table spoons of oil and mix until you get a thick but still liquid dough.
- Add dried raisins and pine nuts. Oil the cake form and fill it with the dough, not more than 2 cm thick, and smooth it out.
- Spatter some olive oil on top and bake it at 200°C for 45 - 60 Minutes, until the surface becomes deeply cracked. Serve it warm with coffee or tea.

2

Nutritional value

This delicious Swiss sweet is a true treasure of energy, minerals and vitamins thanks to the dried fruit that it is the key component. Chestnuts, pine nuts and raisins are rich in

magnesium, potassium, copper, phosphorus, iron, calcium, vitamins B and E, and essential fatty acids, while thyme and rosemary are rich in antioxidants.

Смачного!

Ukraine

Geological units and rocks of the Ukraine (square of 604 thousand km², 0.4% of world land surface) were forming over a giant time span of almost 4 Ga (oldest discovered rocks yield isotopic age of 3.85 Ga).

The imprints of the first known biota (Vendian medusa of Volyno-Podillya) are found, and at the surface one can observe almost the entire Paleozoic – thick Carboniferous sediments in the east (Donbas), Silurian and Devonian rocks in the west (Podillya), and Permian sediments in the east again (Donbas). Mesozoic rocks are known to come from the Donbas and Crimean Mountains and they are widely distributed in the west (Volyn, Carpathians) and somewhere in the north of Ukraine.

The wide enough range of volcanic structures of various ages is known in the Trans-Carpathians and in Crimea, as well as Proterozoic flood-basalts in Volyno-Podillya. The modern and ancient troughs (Black Sea, Carpathians) and depressions (Dniprovsko-Donetska) developed here. The territory of Ukraine underwent numerous sea ingressions caused by old sea basins (Cretaceous, Cenozoic) and recent activities (Pontychniy, Meotychniy, Sarmatskiy Quaternary basins), and even young Quaternary marine terraces.

Active tectonic development in Ukraine has resulted in mountain structures which partly continue to move up to now. These include the impressive Carpathians and even more amazing Crimean Mountains.

The valleys of Dnister, Dniipro, Prut, South Boug, Siverskiy Donets and other rivers are accompanied by various terraces. The Dnister river terrace is comprised of the world river-terrace etalons in terms of expression and study degree.

Because of the nice climate, fertile black earth soils over the loess sediment and the hardworking Ukrainian people, Ukraine was known for a long time as the “Europe granary”. Diverse fertile Ukrainian soils give rise to various grains and vegetables. Ukrainian food seems to be one that is tasty and fruitful. The most known and popular kinds of Ukrainian meals include Borshch and Varenyky.



Borys Maliuk Graduated in 1981 from Department of Geology, Lviv University, Ukraine, and in 1999 from Centre of Geostatistics, Ecole des Mines de Paris, France. Obtained Candidate of Science (PhD) Degree in Geotectonics in 1984, and extended Doctor of Science Degree in Petrology in 1991. At present – Acting Deputy Director of Ukrainian State Geological Research Institute, Kyiv, Ukraine. National Delegate of Ukraine to the EuroGeoSurveys.



1

Varenyky Dough

- Combine the flour and salt in a large bowl, forming a well in the center. Add the soft butter and evaporated milk gently until all the flour is absorbed.
- Add water as needed. Knead dough until it sticks together. Let rest 5 minutes, then knead until smooth. Cover and set aside.
- Place dough in a greased bowl, turn to coat, and cover. Let set for about half an hour. Take 1/3 of the dough, leaving the rest covered.
- Roll out into a circle on a floured surface. Flip dough over and roll it out until it is 1/8 inch thick. Cut into 3-inch rounds.
- Place a tablespoon of filling on one side of the round, flip over the other half and press edges together to seal. Place the dumpling on a floured tray and keep covered.
- In a 3-quart saucepan, drop 10 or so dumplings into boiling water. Cook for 3 to 5 minutes. Drain in a colander. Place on a lightly oiled dish to coat with a thin layer of oil. Coat dumplings so they don't stick together.
- Serve Dumplings with fried onions and sour cream.
- Cold dumplings can be fried in oil and butter for a nice crispy surface.

Potato and cheese filling

- Peel and dice potatoes, cover with water, and boil until soft. Drain and mash. Fry the onions in butter. Add the cheese, onions, salt and pepper to the potatoes and mix well. Allow to cool, stirring occasionally. Once cooled, it is ready to use as dumpling filling.

Sauerkraut and cabbage filling

- Pour off the sauerkraut juice and set aside. Do not use kraut from a can.

2

Nutritional value

A filled in pastry sheet is typical of several culinary traditions. From a nutritional point of view the peculiarity of varenyky is in the filling. The ones made with potatoes and cheese, or with cherries and whipped cream make this dish enough rich in calories and it is very

Best to use sauerkraut in a jar or homemade.

- Fry the onions in butter and add to the sauerkraut. Add the cabbage, bouillon, and reserved juice. Stirring often, cook over low heat until liquid evaporates. Add the pepper.
- Remove from heat and let cool. Run the mixture through a meat grinder or food processor.
- The filling is then ready to use in the dumplings.

Blueberry Filling

- Dust with confectioners' sugar and sour cream. Add cornstarch to blueberry sauce and heat over low until slightly thickened. Drizzle over cooked Varenyky.

Cherry Filling

- Remove stones out of the cherries. Mix with sugar, potato flour, and let the juice flow out.
- Knead the dough out of water, egg, flour, butter and salt. Knead thoroughly, then cover with a hot pot turned upside down and let it stay for approximately 10 minutes. Then cut the dough into 3 equal parts. Shape each of the parts into a roll as thick as a finger, and cut into pieces of the same thickness. Shape each of these small pieces into flat round shapes (like scones). Do this on the board sifted with flour.
- Put 3 or four cherries onto each of the scones. Then bring together the opposite edges of a scone and pinch them so that they don't come apart. When you have a closed semicircular shape with the filling inside, it is the Varenyk.
- Fill a big pot with water, add a little salt to it and bring to boil. Put the Varenyky into the boiling water and boil them for 5 or 7 minutes.

Serve in a dish, chilled, in sour cream.

substantial. The one with sauerkraut and cabbage makes it lighter and rich in fibres and minerals. Two important facts regarding cherries: they contain different polyphenols with antioxidant effect and melatonin which promotes sleep.

Ukrainian Varenyky


Varenyky Dough

- 5 cups flour
- 2 tablespoons butter
- 1 cup evaporated milk
- 1 teaspoon salt - 1/2 cup water

Potato and cheese filling

- 6 medium-sized potatoes cooked and mashed
- 2 large onions, chopped fine
- 1 stick butter (1/4 lb.)
- 1 cup shredded Cheddar cheese
- 2 teaspoons salt, or to taste
- 2 teaspoons pepper, or to taste

Sauerkraut and cabbage filling

- 1 pound sauerkraut
- 2 large onions, chopped fine
- 3 cups shredded white cabbage
- 1 stick butter - 1 bouillon cube
- 2 teaspoons pepper

Cherry Filling

- 400g of flour
- 3/4 of glass of water - A pinch of salt
- 1 egg - 1 tsp of butter
- 800g of cherries
- half a glass of sugar
- 3 tbsp of potato flour
- 200g of sour cream

Enjoy

United Kingdom

Geology, landscape and climate

United Kingdom of Great Britain and Northern Ireland (commonly known as the United Kingdom) and is part of an Archipelago including the Islands of Great Britain and the North of Ireland and over six thousand smaller isles off the northwest coast of continental Europe. The UK also includes three dependencies of the British Crown: the Isle of Man and, by tradition, the Bailiwick of Jersey and the Bailiwick of Guernsey in the Channel Islands, although the latter are not physically a part of the archipelago. Great Britain is the largest island and includes 3 countries, England, Scotland and Wales, covering an onshore area of about 210,000 km². The island is geologically diverse; the oldest rocks occur in the north and west and progressively younger rocks occur to the south and east toward the still subsiding southern North Sea Basin.

Most of the UK has been glaciated several times during the Quaternary, resulting in the deposition of extensive sheets of till in lowland areas and glaciated uplands in Wales and Scotland. These deposits are associated with large spreads of glaciofluvial sand and gravel (pink) and glaciolacustrine sediments (brown) in proglacial and ice-marginal settings.

The extreme southern part of England remained ice-free throughout, and there periglacial mass movement and aeolian sediments and permafrost structures are widespread. Holocene deposits are located along major river courses and in coastal plains (yellow) including the large Wash embayment.

The main influence the UK's climate is the close proximity to the Atlantic Ocean, the northern latitude, and the warming of the waters around the land by the Gulf Stream (a warm current of the northern Atlantic Ocean). The island is small compared with the other land masses in the northern hemisphere – hence the UK's climate is more influenced by the ocean, giving it a so-called "maritime" climate compared with other European countries, resulting in the winters milder compared with other landlocked nations with a similar latitude.

This diverse geology and topography, combined with the climate produce a diverse pastoral and arable landscape, with established dairy farming (and beef production) and grain production in the low land areas alongside market gardens and orchards, with sheep farming dominating the upland areas.

The recipe below is for what can be described as a traditional English dish, of beef steak and ale pie, which would typically be served with potatoes: mashed (or commonly in many contemporary English pubs, deep fried as chips) or boiled "new potatoes" in season seasoned with a little fresh mint, some of the best being grown in Jersey, and typical English vegetables: boiled (or steamed) carrots, peas, cauliflower or cabbage.



Originally trained as a geoscientist, **Vicky Hards** gained both her BSc and PhD from Durham University, specialising in geochemistry and volcanology. She joined BGS in 1995 since when she has held a variety of laboratory, administrative and managerial roles.

Her current role is to assist and support BGS scientists and IT specialists in identifying and capitalising on opportunities to obtain funding for research, and to participate in pan-European initiatives.

Vicky is also the UK EuroGeoSurvey's National Delegate.



Serves 6 generously

BEEF filling

- 1kg braising steak or stewing steak (an economical cut) cut in to large chunks
- 2 large onions, roughly chopped
- 4 large carrots, chopped into large chunks
- 200g mushrooms, halved
- vegetable oil for frying
- 2 teaspoons sugar, 4 tablespoons plain flour
- 300ml dark ale
- 300ml beef stock (the brand Oxo is commonly used)
- 3 tablespoons Worcestershire sauce
- Thyme, bay leaves, rosemary or parsley

Suet crust PASTRY

- 500g self-raising flour, plus extra for dusting
- 250g ground beef suet
- 2 teaspoons sea salt, 125 ml Ice-cold water
- 1 egg, beaten, to glaze and seal the pie

Beef & Ale pie

1

For the beef filling

- Pre-heat oven to 160°C /140°C (fan) or gas mark 3.
- Heat oil in a large casserole dish on the hob.
- Mix the flour, salt, sugar and pepper then roll the meat in seasoned the flour.
- Fry the meat in the hot oil in batches until well-browned on all sides. Keep the heat high to do this. This adds flavour to the finished pie.
- Set the browned meat aside.
- Add the onions and carrots to the dish, with additional oil if required then cook on a low heat for 5 minutes. Add the mushrooms, raise the heat again and fry for 1 minute more to brown them.
- Replace the meat and its juices in the dish and stir well.
- Pour over the ale and stock.
- Add the herbs and bring everything to a gentle boil (simmer).
- Cover the dish with a lid and place in the oven for about 2 hours, or until the meat is really tender.
- Leave everything to cool completely – the pie filling can be made in advance and kept it in the fridge as the pie will be better if the fillings fridge-cold when added to the pastry.

Suet crust pastry

Suet produces fantastic flavour and as it melts much slower than butter and other fats. As a result these which tend to blend into the pastries unlike suet which can melt once the pastry has begun to set, making little puffs in the dough to create a really light pastry

2

Nutritional value

Very quaint and nutritionally complete this traditional English dish in which beef, expertly softened by cooking with dark beer and made more tasty by the various vegetables and herbs, is covered with a pastry crust. The major nutrients (carbohydrates, proteins and fats)

- Pre-heat oven to 220C/200C fan/gas mark 7.
- Combine the flour suet, salt in a bowl and mix well
- Add the water (with additional if necessary) stirring well until the mixture resembles a soft sticky dough.
- Knead gently then wrap this in cling film and allow to rest for 10-15 minutes.
- Grease a 24-28 cm pie dish and dust well with flour.
- Cut a third off the pastry and set aside. Roll the pastry out on a floured surface to a thick-ish round that will easily line the pie dish with an overhang, then line the dish.
- Add the beef to the dish using a slotted spoon so some gravy is left in the container, as you don't want too much sauce in the pie. The filling should reach at least the rim of the pie dish, or stand slightly above.
- Roll out the remaining pastry to a thick round big enough to cover the dish.
- Brush the edges of the pastry around the edge of the dish with a little of the beaten egg, then cover with the pastry lid. Trim the edges, crimp the pastry to properly seal the edges of the pie, then re-roll your trimmings to make a decoration.
- Brush the top heavily with the beaten egg. Make a few little slits in the centre of the pie.
- Place on the pie dish on a baking tray, then bake for 45 minutes until golden.
- Allow the finished pie to rest for 10 minutes, meanwhile re-heat any left-over gravy (juices) from the casserole dish to serve with the pie.
- Serve piping hot with potatoes and vegetables.

are well represented. In particular the meat provides noble proteins and vitamins of the B group. Potatoes and vegetables can served as a side dish to complement the nutrient content with carbohydrates, fibres and minerals.

Zum Wohle Gezondheid

Živjeli Na zdraví! Bon profit

Skål Kippis ΣΤΗΝ ΥΓΕΙΑ ΣΑΣ

Zum Wohl!

Santé Sláinte

Egészségedre

Salute

Bis-saħħa

Saúde

Na zdrowie

¡Salud!

Skål Na zdravje

Gsundheit

Viva

Proost

Cheers

Будьмо