Ulla Skovsbøl

We share a sea

Illustrations Eva Wulff

THE DANISH ECOLOGICAL COUNCIL
AND FRUGTFORMIDLINGEN

WE SHARE A SEA
The Danish Ecological Council and Frugtformidlingen
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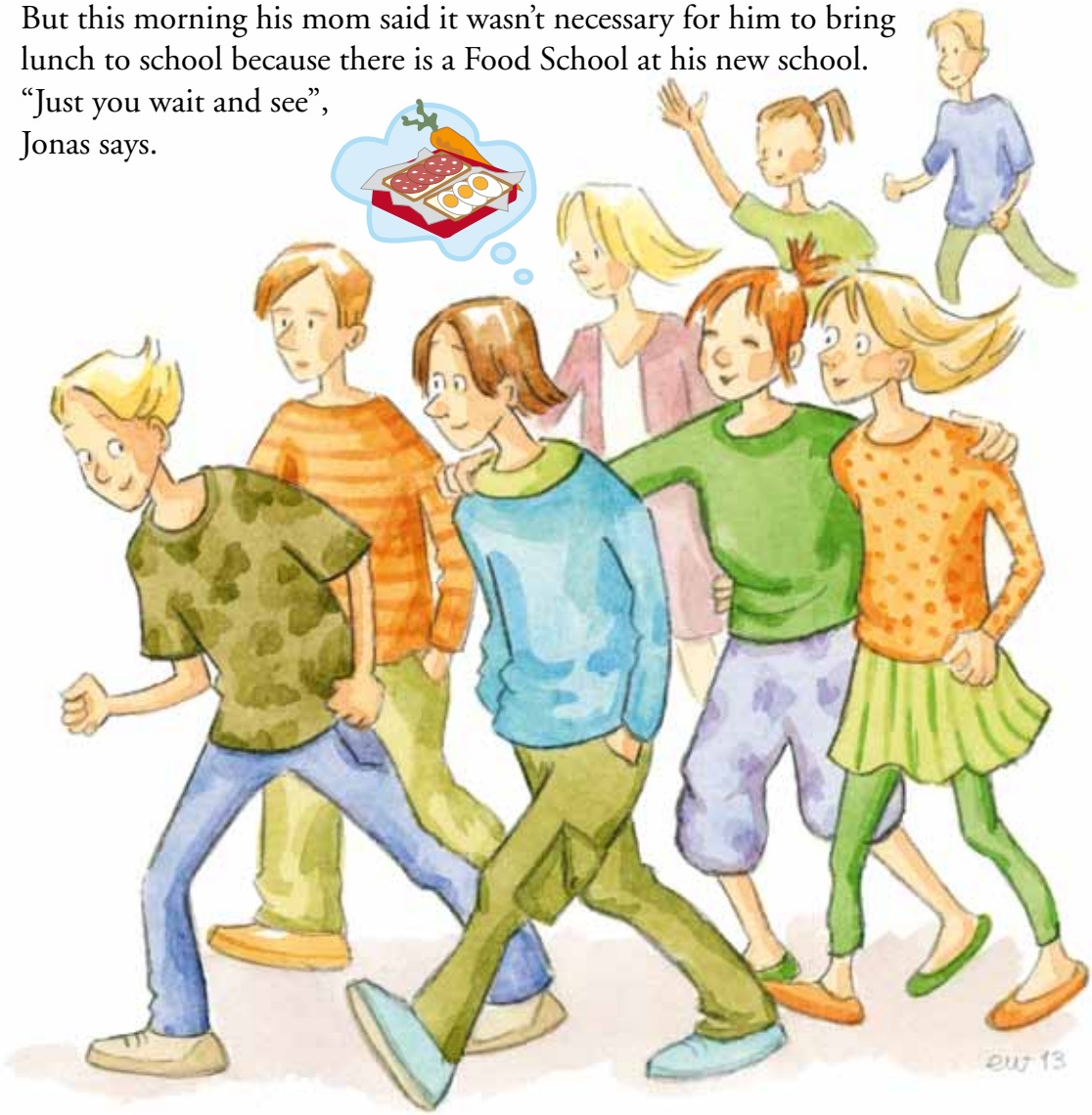
The book is also available in Danish at www.videlerethav.dk.

The events in this story are fictional, but the farmers Elisabeth and Jens Otto at Stone Farm are real people. The fisherman Poul Elo in Roedvig and Karin and Katrine from Amager Faelled School are also real people. The five children are fictional characters.

Simon goes to Food School

The bell rings telling children it's time for their lunch break at Amager Faelled School in Copenhagen. Students from class 6A run out of their classroom, down the stairs and across the schoolyard. Simon tags along. He is the newcomer in class because he just moved to Copenhagen with his father and mother and little sister.
"Where are we going?" he asks the boy next to him.
"We're going to the Food School to have lunch", Jonas replies.
"What's the Food School?"
Everyone at Simon's old school brings his or her own lunch. Simon's lunch usually consists of a sandwich and a half and sometimes a carrot.
But this morning his mom said it wasn't necessary for him to bring lunch to school because there is a Food School at his new school.
"Just you wait and see",
Jonas says.

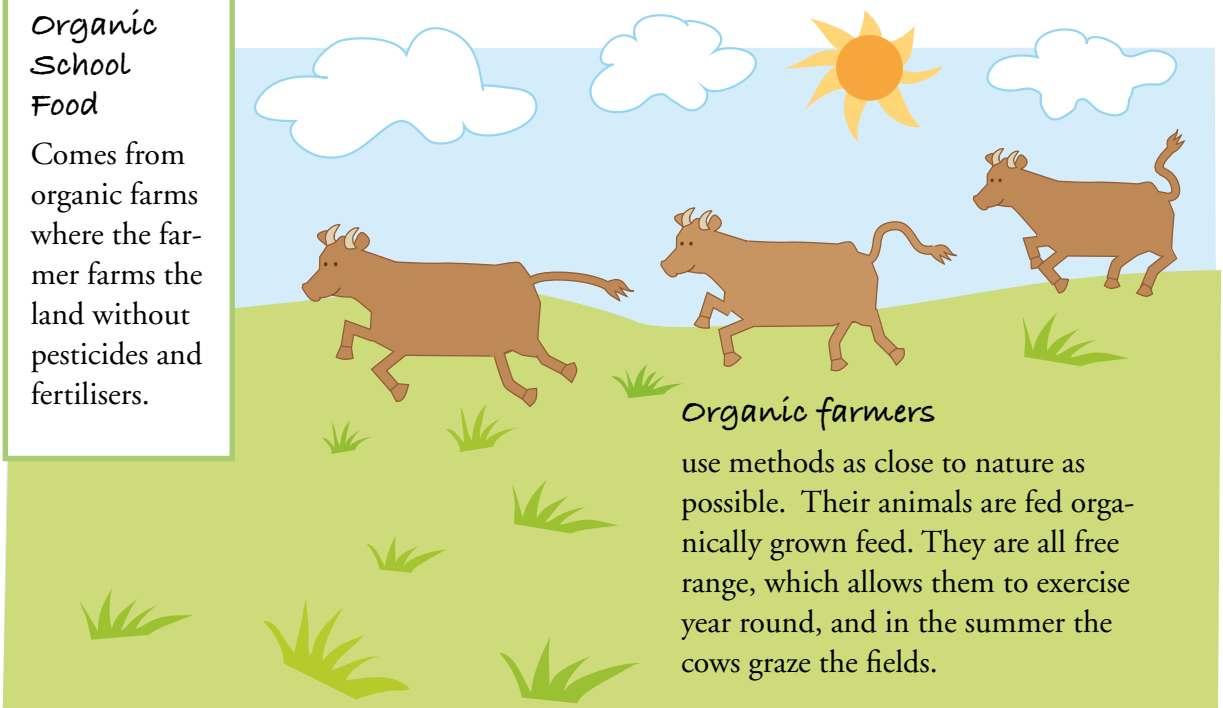


Healthy school food is good for the environment

"Stay in line and stop pushing each other. There's enough food for everyone", Aicha yells. Together with Line and Faruk she scoops meatballs and vegetables on the students' plates. Fried potatoes and homemade whole-wheat buns are also part of the lunch.
The three kitchen assistants are also in Simon's class, but they haven't been to Danish, Math or English class this morning. They are helping out in the school kitchen this week. They start by cooking and serving the food. Then they do the dishes, and finally they have "kitchen classes" where they learn about healthy food.
"Wow, that looks delicious", Simon says, thinking about the boring sandwiches he usually digs out of his bag.
"Aren't you having vegetables and a whole-wheat bun?" Aicha asks when she sees Simon's plate. He has taken three meatballs and a big portion of potatoes.
"It is easy to see you haven't yet been to Food School. Otherwise you would have taken less meat and more vegetables", she says.
Simon laughs: "What?"

Organic School Food

Comes from organic farms where the farmer farms the land without pesticides and fertilisers.



Organic farmers

use methods as close to nature as possible. Their animals are fed organically grown feed. They are all free range, which allows them to exercise year round, and in the summer the cows graze the fields.

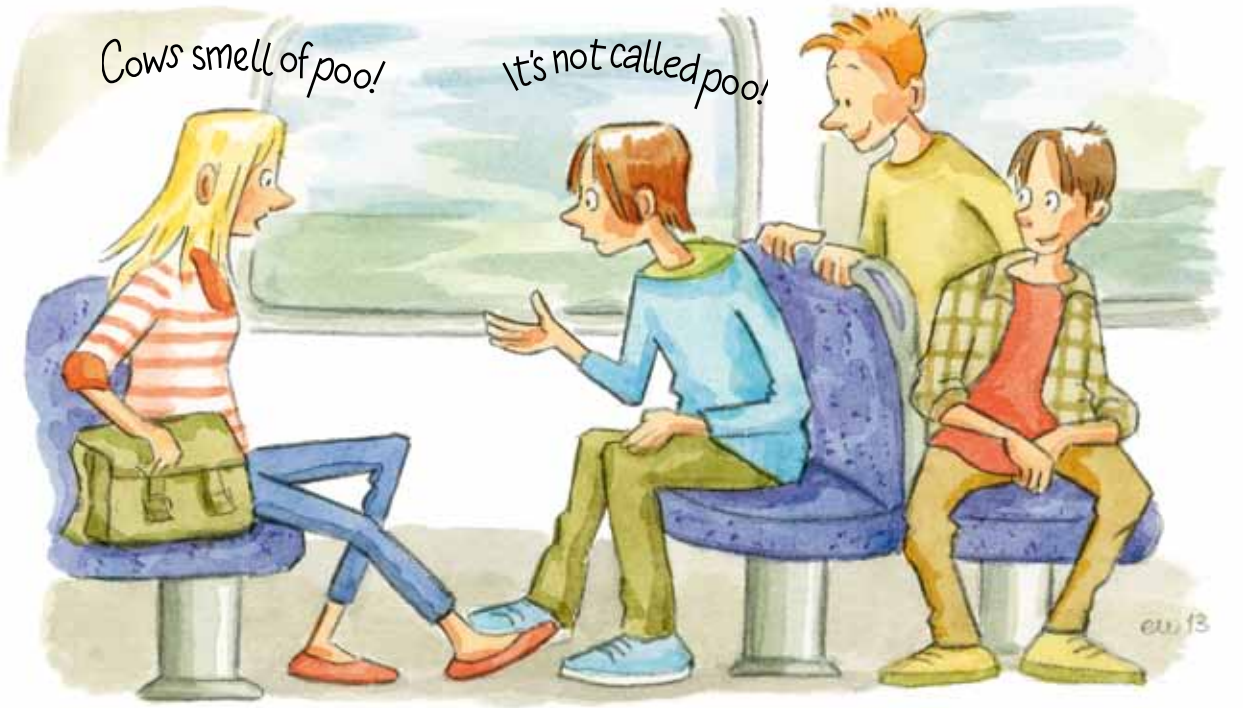
But Aicha looks serious.
"If you want to eat healthy and in an environmentally friendly way, you have to eat less meat and more vegetables. That's what we do at our school. Almost all our food is organic and sometimes we have vegetarian dishes completely without meat", she says.
"Exactly, and on top of that our science teacher Karin tells us to think about whether the food is 'a diet for a clean Baltic'", Line adds. She's standing next to Simon.
"A diet for a clean Baltic?" he asks.
Simon thinks it sounds pretty ridiculous. He has heard about organic food, even though he can't completely explain what it is. But "Diet for a clean Baltic", what is that? Food is food, and the Baltic Sea is a sea. What does his lunch have to do with the sea? There's not even fish on the menu!
"It's true", Faruk says. "The theme this month is the Baltic Sea. We learn about it in Food School and in our science classes. We have to find out how we can eat in a way to create a cleaner sea. It has to do with agriculture and the way the land is farmed. In fact, we have a trip next week to a farm to hear how it's all connected".
Simon thinks it all sounds strange and a bit silly, but his new classmates seem really nice and he wants to join the excursion.

Eat organically grown food. It is good for you, for the animals and for the environment.

Diet for a clean Baltic?

Manure, fertiliser or nutrients?

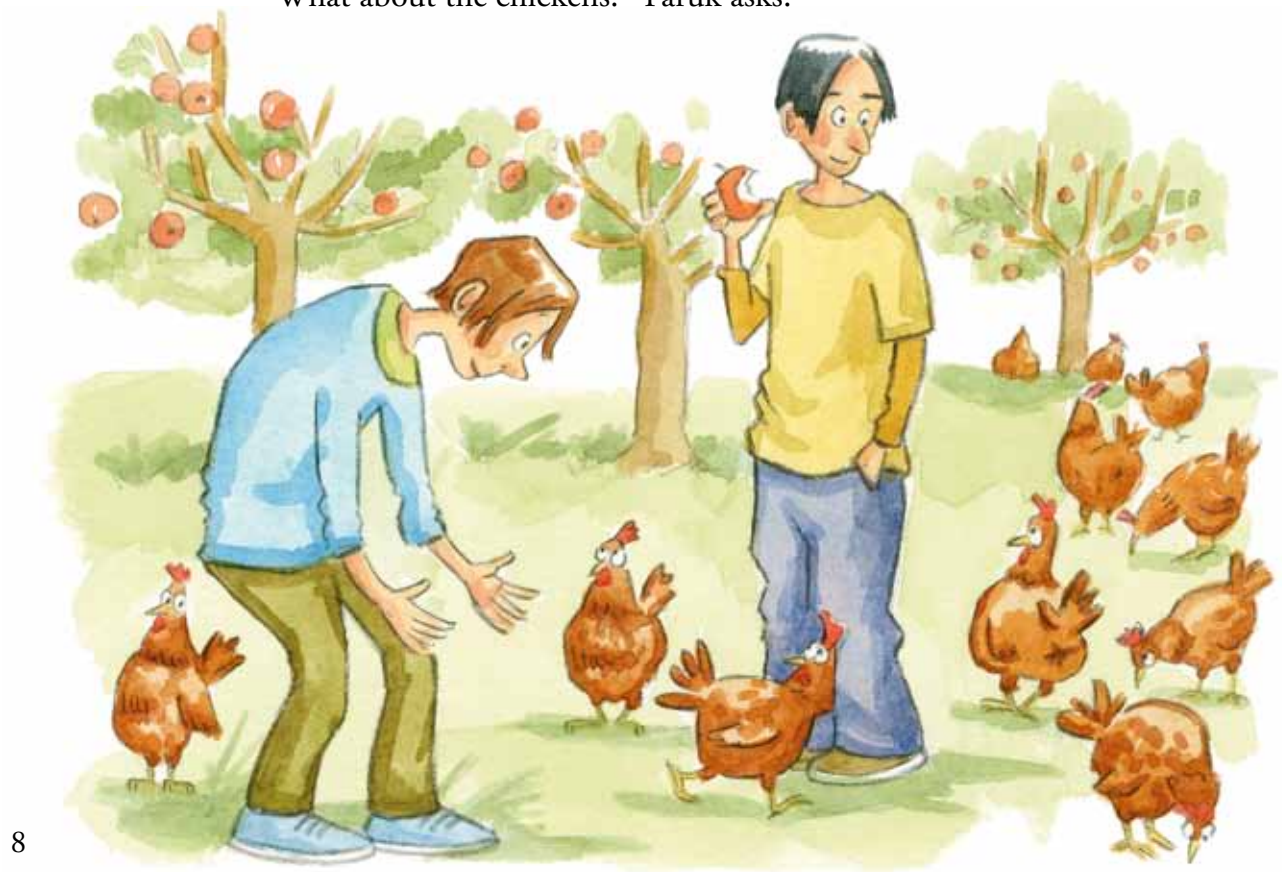
Next Wednesday the whole class is going to the country. They are going to visit Stone Farm, an organic farm north of Copenhagen. First they take the train, then the bus and finally they walk almost two kilometres before they get to the farm.
"I've never been on a farm before", Faruk says while they are on the train.
"Neither have I", Line adds.
"I've been on a farm plenty of times", Simon says.
"Before we moved to Copenhagen, we lived in a small town in Jutland. There were a bunch of kids from the country at my old school. My best friend Frederik lives on a big farm with 350 cows in a huge, new barn.
"How can his dad and mom take care of so many animals?" Jonas asks. "We have a dog and it is hard enough for us to find time to walk it and agree upon who will do it".
"The cows aren't walked, silly. They are indoors all year round. They get most of their feed from a feeding truck, but they also have a feeding machine where they can get extra food. All the cows have a collar around their necks with a small chip. The chip makes sure that they get just the right amount of food from the feeding machine. Robots milk them. Frederik's dad controls the robots from a computer in his office", Simon explains.



The others look at Simon in disbelief.
"It probably smells of poo because of all the cows", Line says.
"Cows smell of poo".
"It's not called poo", Simon says. He is annoyed.
"It's called cow's dung when it's solid waste and slurry when it is liquid waste. You can also just call it manure. It's something the plants in the field need to grow, so manure is a good thing", he says.
Line has a hard time believing there is anything good about cow's dung.
"It's true. Simon is telling the truth", Karin, their science teacher, says. She's sitting on the seat across from them on the train.
"Apart from the fact that it smells, manure can be good and bad. That is exactly what we are going to learn about today when we visit the farm. The plants need certain ingredients in the animals' dung to grow, but if the dung ends up in the wrong places – for instance in the Baltic Sea – things can go wrong", she says.
The train stops at a small station and Karin and the children get off the train and get on the bus. But Simon is still wondering why there is so much talk about the Baltic Sea and what both the school food and the cows' dung have to do with it.

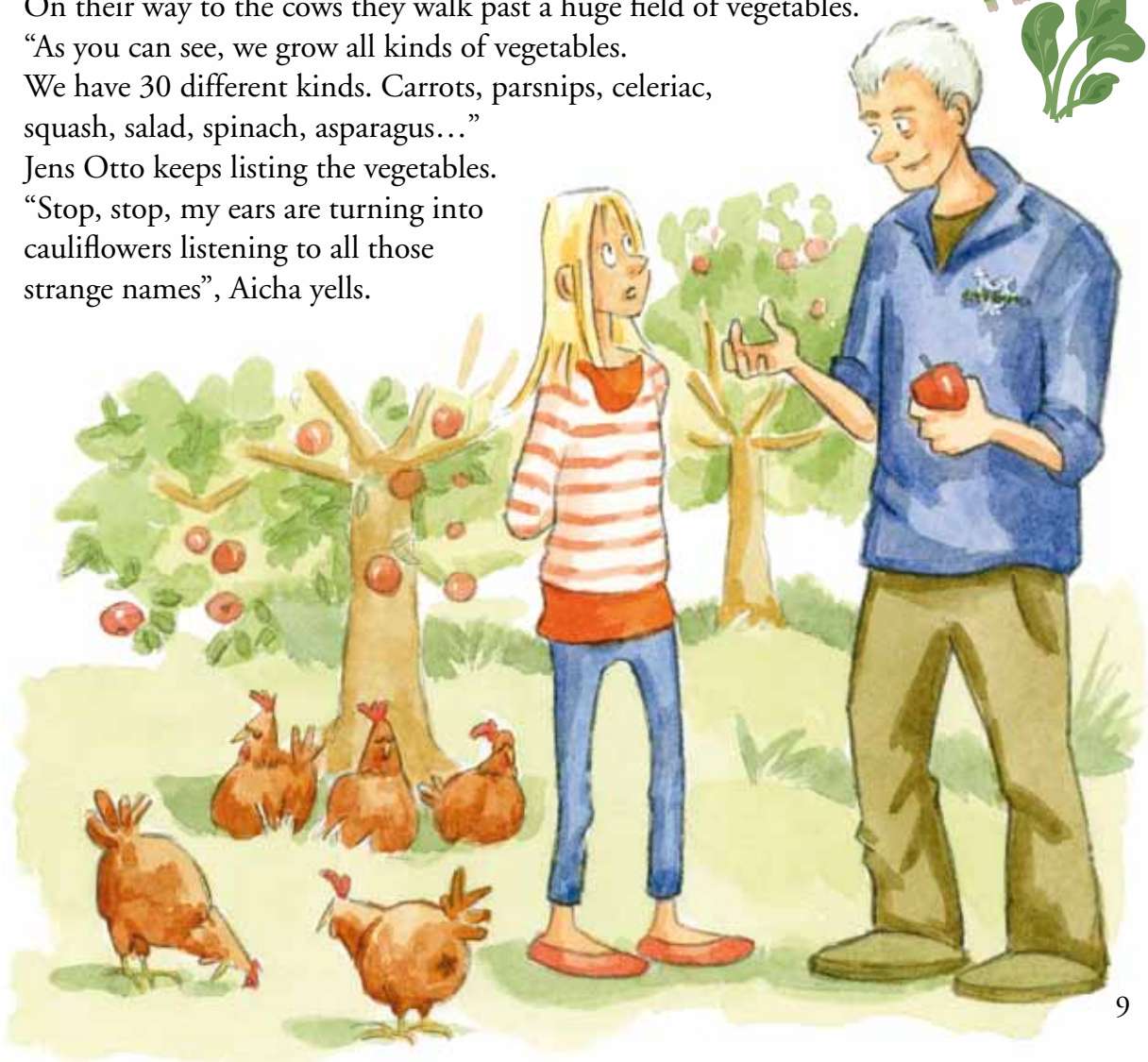
Stone Farm – an organic farm

"Welcome to Stone Farm", Elisabeth says when the class finally reaches the farm.
"Come to the back garden. I'm sure you could use a refreshment after such a long walk".
Elisabeth owns Stone Farm with her husband Jens Otto.
In the back garden she has placed a large basket of fruit on a table.
"Everything is from our own fruit trees", she says.
"Cool!" Faruk exclaims and reaches for a red apple.
"The pears look really good too", Line says and takes a bite of one.
"Go ahead and eat. There are plenty. We have 500 fruit trees. Right now apples and pears are in season, but we also have five different kinds of plums and five different kinds of cherries. The trees grow in the chicken coop. We will head over there in a little bit".
"Wow, that must be a gigantic coop if there's room for 500 trees. What about the chickens?" Faruk asks.

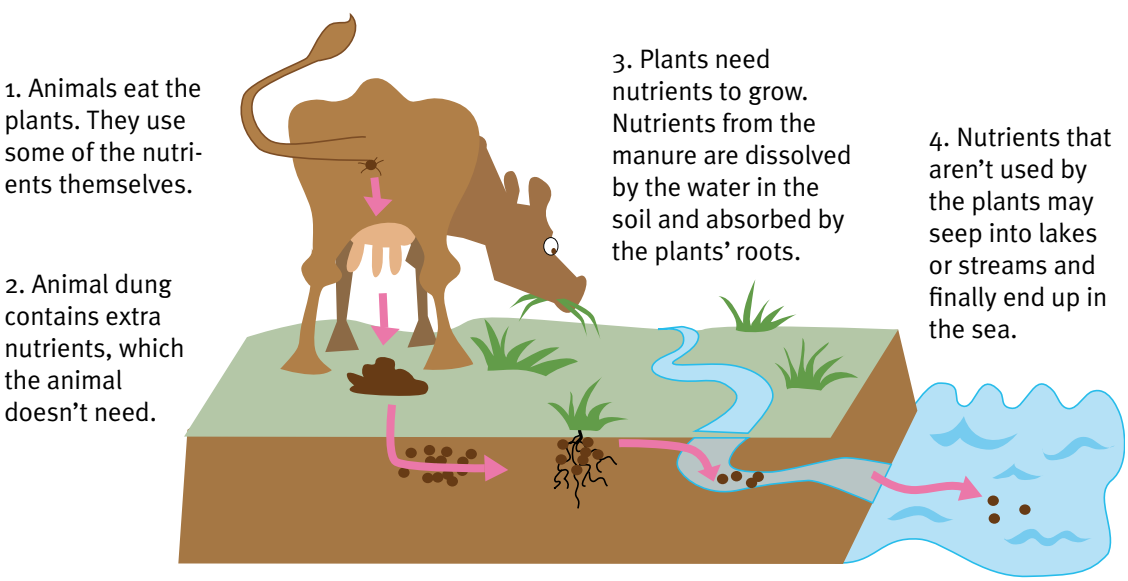


“Yes, and honestly, why are there fruit trees in the chicken coop?” Simon asks.
“That’s because Stone Farm is an organic farm, and we don’t use pesticides to get rid of weed. The chickens eat the plants that grow between the trees as well as the insects that can ruin the fruit. That way we avoid using pesticides”, she explains.

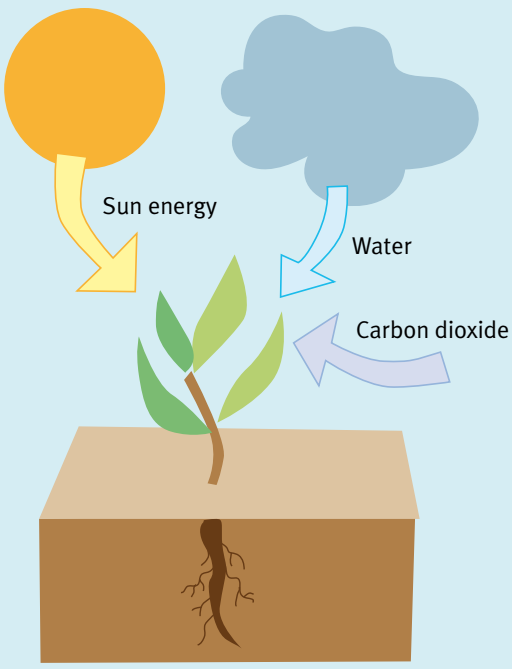
The chicken coop is full of brown hens, a total of 3,000 birds. They lay a lot of eggs, which Elisabeth and Jens Otto sell. Some chickens rest in the shade under the trees; others peck at insects and plants on the ground.
“Don’t you have other animals?” Line asks. “Yes, we do. You’re all welcome to come out and look at the cows. We have 25 cows and their calves grazing the field,” Jens Otto says.
He has just walked out of the barn.
On their way to the cows they walk past a huge field of vegetables.
“As you can see, we grow all kinds of vegetables.
We have 30 different kinds. Carrots, parsnips, celeriac, squash, salad, spinach, asparagus…”
Jens Otto keeps listing the vegetables.
“Stop, stop, my ears are turning into cauliflowers listening to all those strange names”, Aicha yells.



"Tell us something about 'a diet for a clean Baltic' instead. Karin, our science teacher has given us an assignment. We have to find out what it is, but we have no clue what the Baltic Sea has to do with cows and chickens and apples and pears and squash and spinach", Aicha says.
"They go on and on about that Baltic Sea. What is wrong with it, and why have we gone on a trip to a farm to find out?" Simon thinks to himself.
"There's a good explanation for that", Jens Otto says as if he can hear what Simon is thinking.
"Agriculture and the sea actually have a lot to do with each other. On our farm we use organic methods to farm the land", he says.
"As Elisabeth explained, that means that we don't use pesticides to get rid of weeds and pests. But that's not the entire story. We don't use commercial fertilisers either as most other farmers do".
"Organically grown plants also need nutrients, just like all other plants. But on this farm we get the nutrients from the animals, for instance from cow dung, and from some plants called legumes such as peas and clover", Jens Otto explains.
"We also make an extra effort to take care of our nutrients so they don't end up in the wrong places. If there are too many nutrients in the ground, they are easily washed through the different layers of earth when it rains. If that happens, they end up in the creek or the stream and finally in the sea. They create a lot of damage there. We want to avoid that", he says while eating an apple.

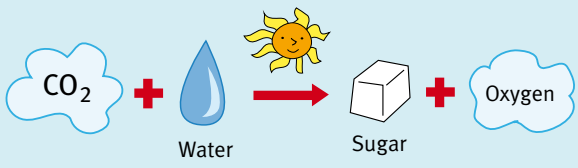


How do plants grow?



Photosynthesis

Humans and animals get their energy from the food they eat. Plants get their energy from the sun. In a process called photosynthesis, plants use energy from the sun to change carbon dioxide (CO2) and water into starches and sugars. These starches and sugars are the plants' food.

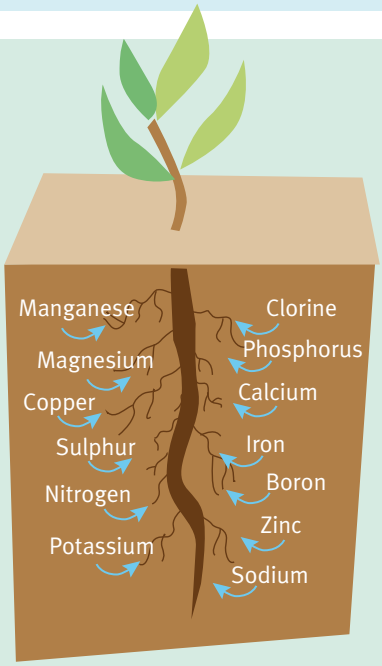


Photosynthesis is the basis for all life on Earth. Oxygen is important for animals and humans. We get oxygen when we breathe. Without oxygen we die. The plants use oxygen too, but they produce much more than they use.

The plant gets its nutrients from the earth

Plants need sugar to build their stems, leaves, roots, fruits and flowers, but they also need a number of other substances, nutrients, which they collect from the soil. The most important of these are nitrogen, phosphorus and potassium.

The nutrients are naturally found in the soil, but when you grow a whole field with a crop such as corn or potatoes, you need to give the plants extra nutrients. Organic farmers use manure or grow legumes to secure the plants all the nutrients they need.



Around the Baltic Sea

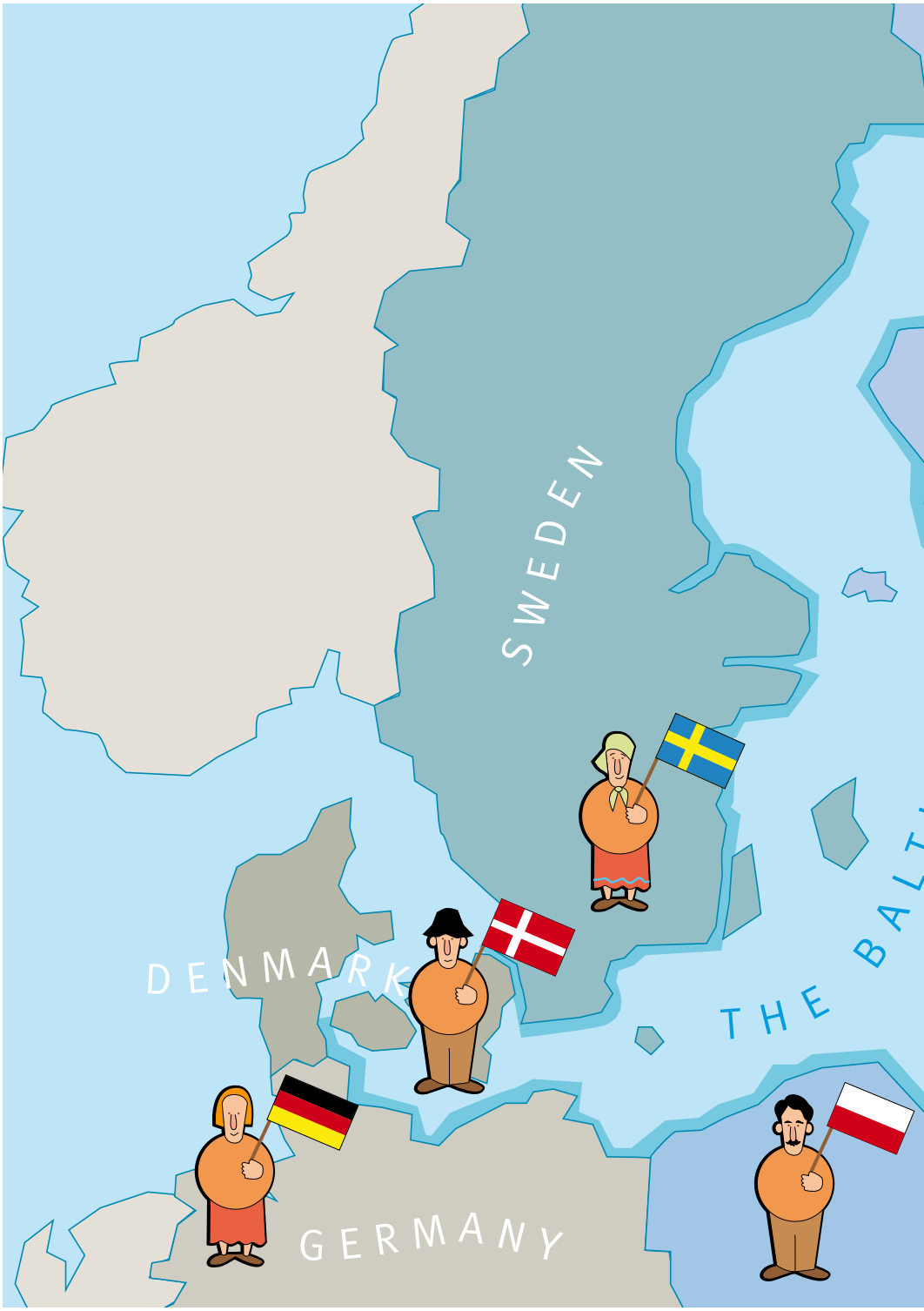
Sweden
Capital: Stockholm.
Population:
9.5 million.
Area: 450,000 km²
Agriculture: 8.1 %
of the area.

Denmark
Capital: Copenhagen
Population:
5.5 million.
Area: 43,000 km²
Agriculture: 63.5 %
of the area.

Germany
Capital: Berlin.
Population:
81.1 million.
Area: 357,000 km²
Agriculture: 51.7 %
of the area.

Poland
Capital: Warsaw.
Population:
38.2 million.
Area: 312,600 km²
Agriculture: 52.6 %
of the area.

Kaliningrad
- is part of Russia.
Capital: Kaliningrad.
Population: 942,000.
Area: 15,000 km²



Lithuania
Capital: Vilnius.
Population:
3.2 million.
Area: 65,300 km²
Agriculture: 52.7 %
of the area.

Latvia
Capital: Riga.
Population:
2.1 million.
Area: 62,000 km²
Agriculture: 31.7 %
of the area.

Estonia
Capital: Tallinn.
Population:
1.3 million.
Area: 45,000 km²
Agriculture: 51.2 %
of the area.

Russia
Kaliningrad and Sankt Petersburg are located by the Baltic Sea.
Capital: Moscow.
Population:
142.5 million.
Area: 17,000,000 km²

Finland
Capital: Helsinki.
Population:
5.4 million.
Area: 338,000 km²
Agriculture: 7.4 % of
the area.

Source: Eurostat.

Good farmers take good care of the nutrients

Jens Otto has eaten his apple to the core, and he continues to talk about agriculture and nutrients.

"When we sell fruit and vegetables, corn, eggs, milk and meat, we also remove the nutrients which would otherwise be recycled on the farm. That is why we need to add new supplements of those substances called nitrogen, phosphorus and potassium. This applies to both organic farmers and non-organic farmers", he explains.

"I know all about that", Simon says. "I also know that you abbreviate those substances with the letters N-P-K. That's what it says on the bags of fertiliser stored in Frederik's dad's machine shed.

"Yes, that's probably true", Jens Otto says. "Only, on an organic farm the nutrients aren't from such fertilisers, but from manure and legumes".

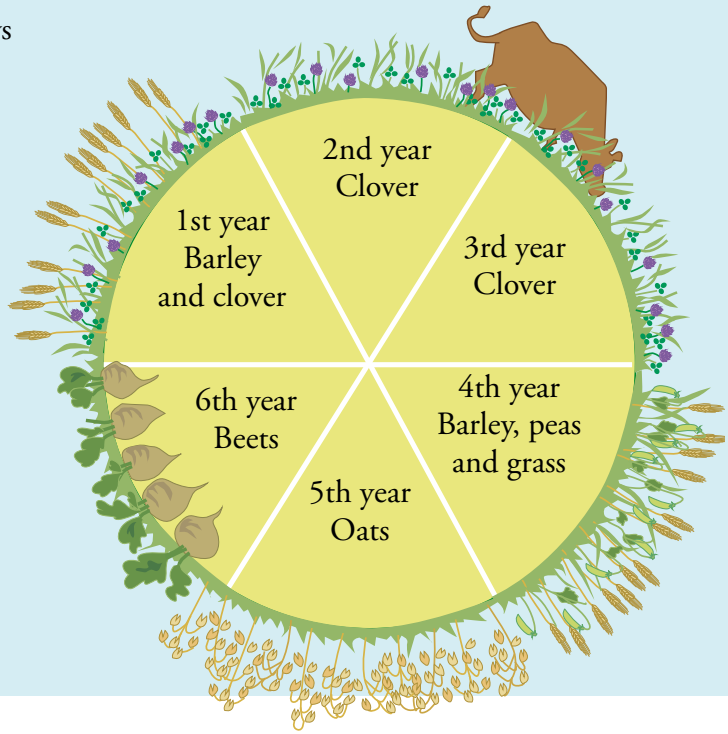
"But whether or not you are an organic farmer, you always have to take good care of the nutrients in the soil. Here at Stone Farm we are especially careful with the nutrients. We call our farming method Ecological Recycling Agriculture. We cooperate with other organic farmers around the Baltic Sea to find out how to farm our land so we don't pollute our shared sea".

Legumes get nutrients from the air

Organic farmers like Elisabeth and Jens Otto do not use commercial fertilisers. The plants in their fields get their nutrients from manure and from legumes such as clover and peas. On the roots of legumes are root nodules, which contain nitrogen-fixing bacteria. Those bacteria take nitrogen gas from the air and convert it into nitrogen compounds, which the plants need to grow.

Rotation of crops

To ensure enough nitrogen from the legumes in all fields, organic farmers change their crops from year to year in a certain sequence. This is called crop rotation. For instance, one year they will plant barley, clover and grass in one field. When the barley is harvested, the field remains a clover-grass field for the cows to eat. The root nodules on the clover plants supply the field with nitrogen. The field of clover remains for a couple of years until the farmer ploughs it and plants another kind of crop.



"So what have you discovered?" Line asks.
"We have found out that it is good if we don't have too many animals on the area available to us", Jens Otto answers. "With fewer animals there are less nutrients per field. That way the surplus nutrients are lowered and thereby we lower the risk of the nutrients getting washed out into the sea", he explains.
"We have also found out that it is good if we grow the feed for the cows ourselves and make sure that the manure comes from our own animals and legumes. We also need to make sure that we have good crop rotations. That means that we plant and harvest different kind of crops in the fields from year to year, and don't just plant the same kind of crop every year. Finally, we have to make sure that plants grow in the fields even in winter, because if the field is empty and bare then the nutrients are easily washed away. Farming the land in this manner is called Ecological Recycling Agriculture and abbreviated ERA", Jens Otto says.

A trip to the sea

Back in class, Simon and Jonas, Aicha, Line and Faruk talk with their science teacher Karin about what they learned at Stone Farm. They agree that it was fun to be on the excursion. The apples and pears tasted delicious and Elisabeth and Jens Otto were nice people. Despite this, none of them can explain why it is so important to be careful that nutrients from farming do not make their way into lakes, streams and the sea. Nutrients are good because they make the plants grow. Jens Otto said so himself.

"There are green plants in the sea too. Seaweed and algae, for instance, and they need nutrients to grow too, don't they?" Jonas asks.

"That is true", Karin answers.

"But despite that, there is a problem. What the problem is, you lucky people can find out for yourselves. Next week we are going on another excursion. We are going to visit a fisherman called Poul Elo. He lives in a coastal village south of Copenhagen right by the Baltic Sea. Poul Elo has been a fisherman for 40 years, and he is really tired of the fact that too many nutrients from agriculture are let out into the sea. It is not good for the fish, you see".

Poul Elo's fishing boat is moored at Roedvig fishing harbour, and the school has rented a bus so the class can get there.

"Hi there! Come over here", Poul Elo shouts when he sees the children get out of the bus. He's on the deck of his small fishing boat. The motor is chugging. He has just docked.

"You have come to hear how things are with the fishing industry? Then you've come to the right place", he adds as the children approach the fishing boat.

A shared sea – a cleaner sea

In 1974 all the countries surrounding the Baltic Sea agreed to cooperate to improve the condition of the sea they share. They all signed a written agreement. It is called the Helsinki Convention, because it was agreed upon in Finland's capital. The cooperation to realise the agreement is called the HELCOM-cooperation.

A dead seabed

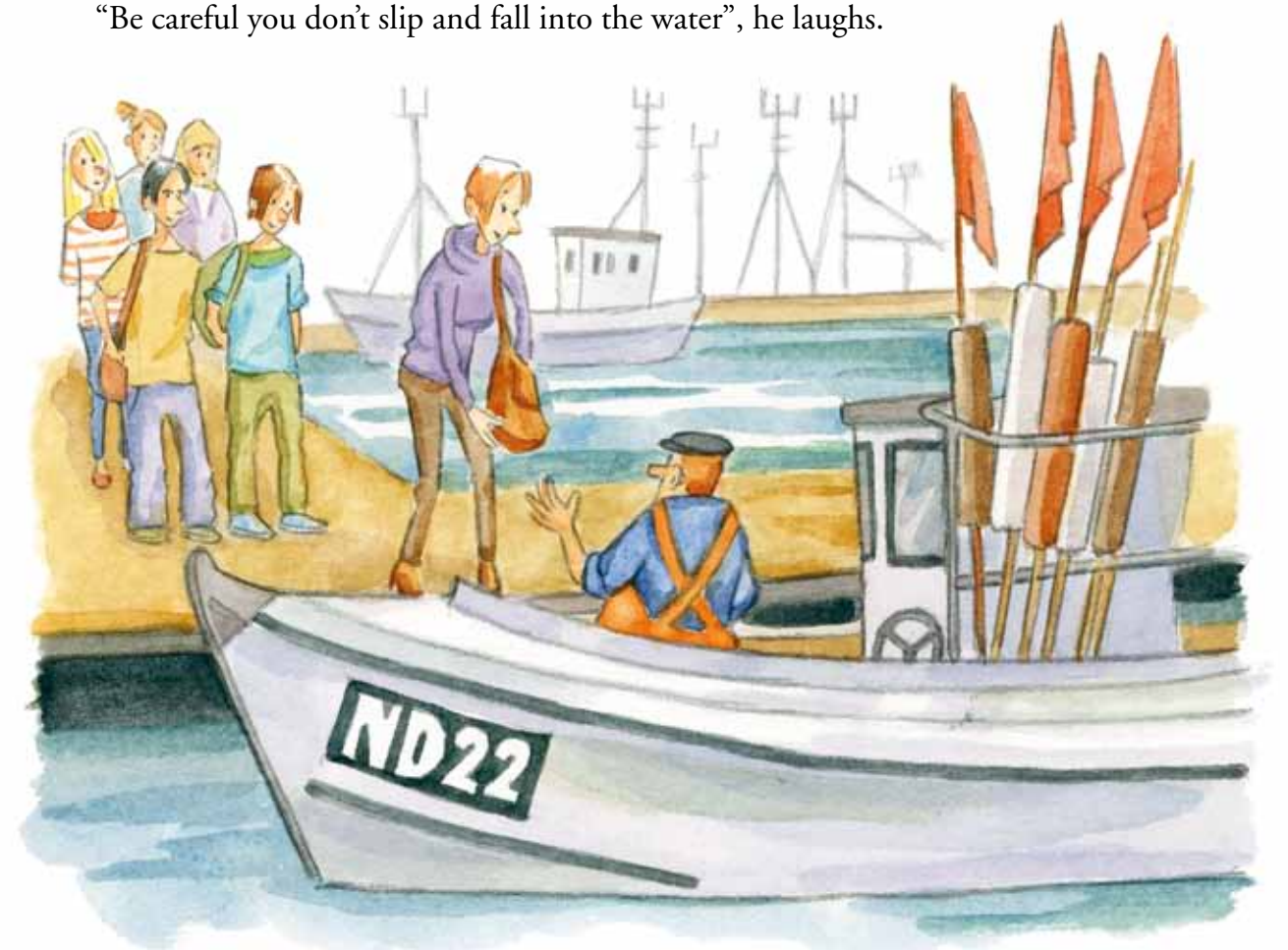
The Baltic Sea has the world's largest area of dead seabed because pollution has killed all life. In 2008, an area almost the size of all of Denmark – 42,000 km2– was completely dead.

"Yes, we have come to get an answer for why nutrients are bad for the sea and how one can eat in a way that helps clean the Baltic Sea", Line says.

"Honestly, we think it's a stupid question. But we have been given this assignment, and we've been told you might be able to help us", Simon says.

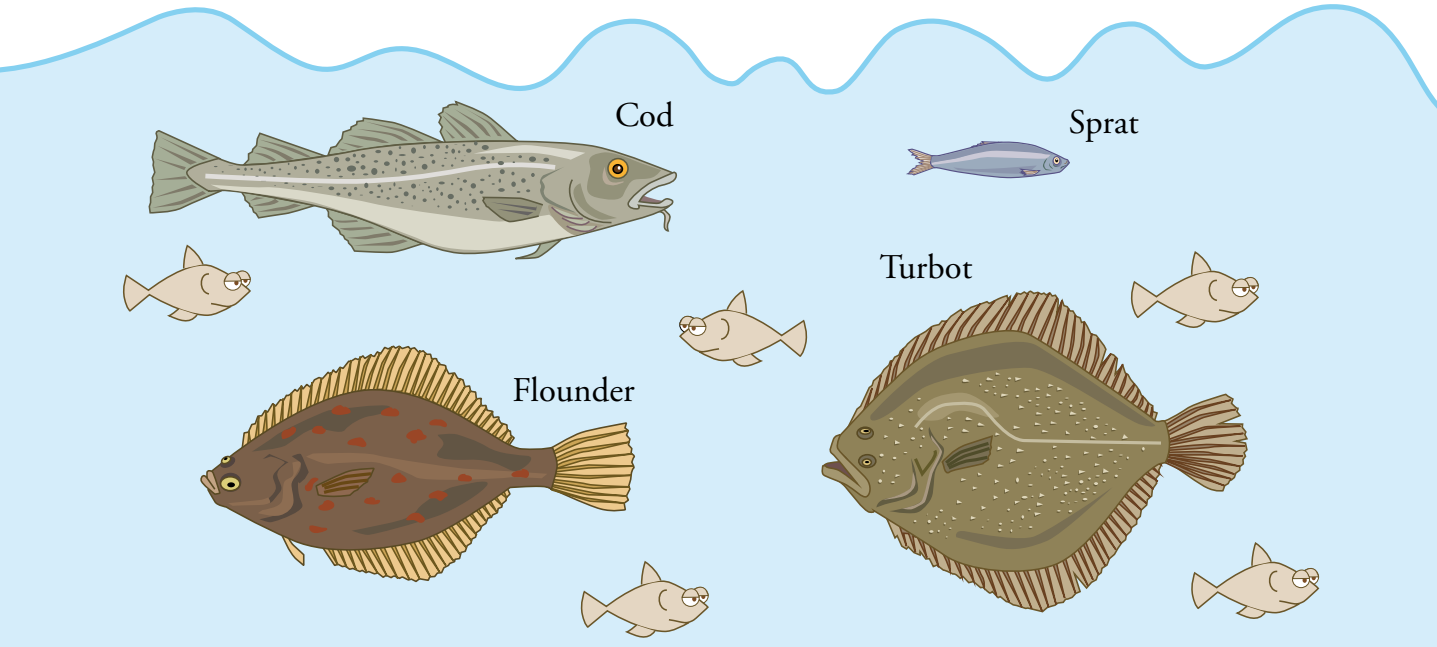
"It's not such a stupid question when you think about it, and I will be happy to try to give you an answer, but step on board first", Poul Elo says.

"Be careful you don't slip and fall into the water", he laughs.

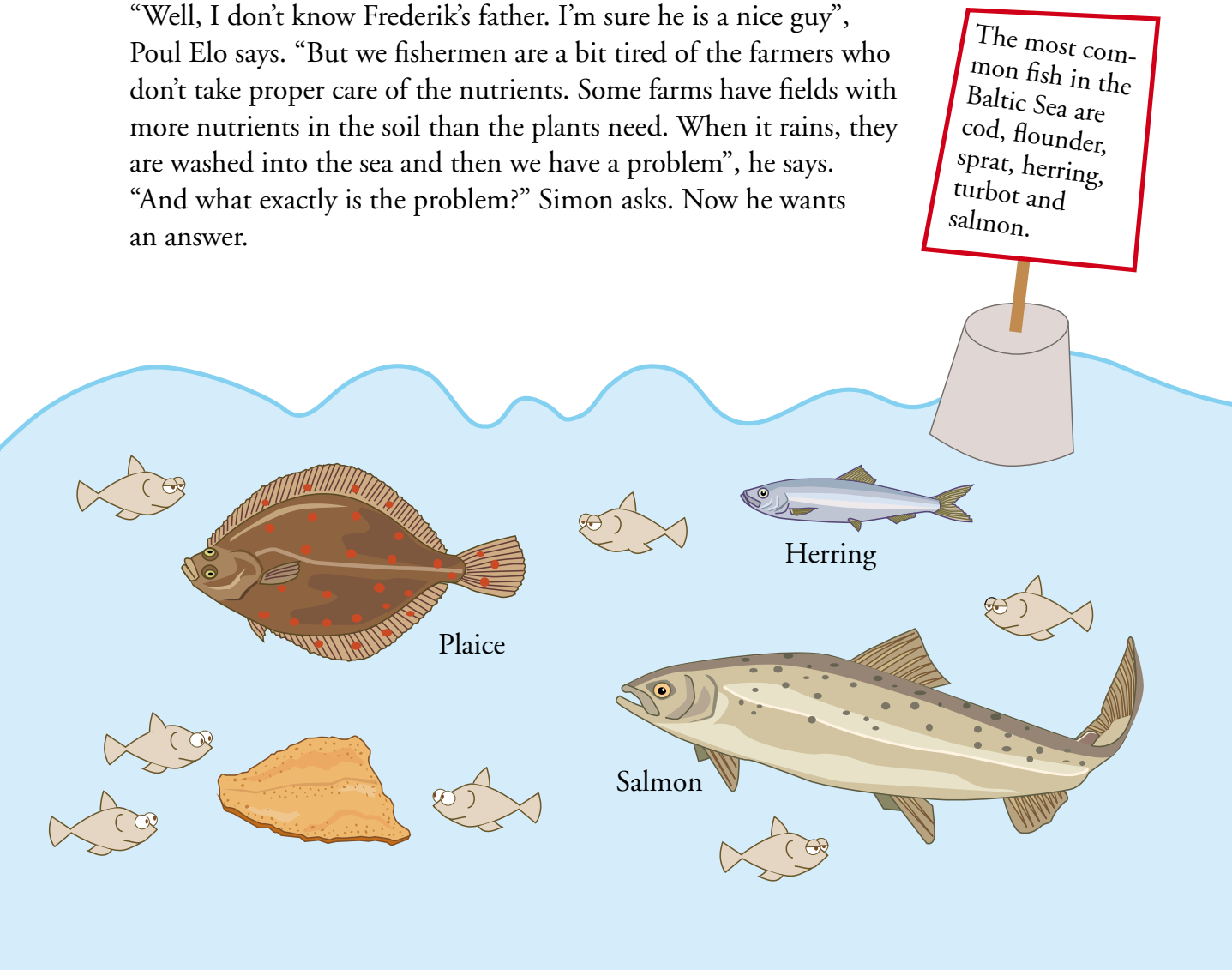


It's not easy being a fish in the Baltic Sea

On deck, Poul Elo has put out a big box of fish.
"You are welcome to touch them, there are all kinds of different fish, and they are even still wiggling", he says.
"I know that one. It's a plaice", Jonas says and reaches for a flat fish in the box.
"Noooo, plaice are covered in breadcrumbs and deep-fried", Line says.
"That's when they've been skinned and cleaned and dipped in eggs and bread crumbs and fried", Poul Elo says.
"But that one, that's actually a flounder. Plaice and flounder look a bit alike and they both live in the Baltic Sea. So do cod and herring, salmon, sprat and turbot. I usually catch cod and flounder".
Aicha grabs a big cod, but it slips away from her.
"Eeeww, it's cold and slimy", she shrieks and pulls away.
"That's how cod feels to the touch. Unfortunately, there's not as many of them as there once were", Poul Elo says.
"How come?" Faruk asks.
"There are several reasons, but one reason is pollution. We humans dump a lot of bad stuff in the Baltic Sea and it's not good for the fish", Poul Elo says.

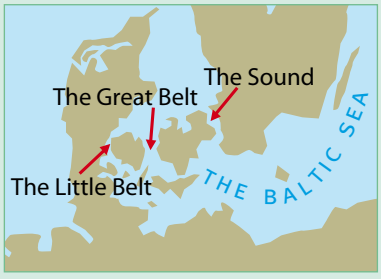


"For years, the countries around the Baltic Sea have poured wastewater directly into the sea without rinsing it first. You can imagine that it's not good for the fish if chemicals from factories and waste from thousands of toilets are dumped on top of them," he explains.
"Aye! Why do we constantly have to hear about poo?" Line interrupts with disdain in her voice.
"When we were on the farm, we had to hear about cow's dung, and now we have to hear about human waste and wastewater that is led directly out into the sea. I think it's disgusting!"
"Yes, I agree, but most countries surrounding the Baltic Sea have become very good at rinsing the wastewater. And since you yourself mention cow's dung, I have to say that there are still some farmers who haven't really gotten their part of the pollution under control", Poul Elo says.
"I think everyone is picking on the farmers. It's not fair. Frederik's father is a really good farmer", Simon exclaims.
"Well, I don't know Frederik's father. I'm sure he is a nice guy", Poul Elo says. "But we fishermen are a bit tired of the farmers who don't take proper care of the nutrients. Some farms have fields with more nutrients in the soil than the plants need. When it rains, they are washed into the sea and then we have a problem", he says.
"And what exactly is the problem?" Simon asks. Now he wants an answer.



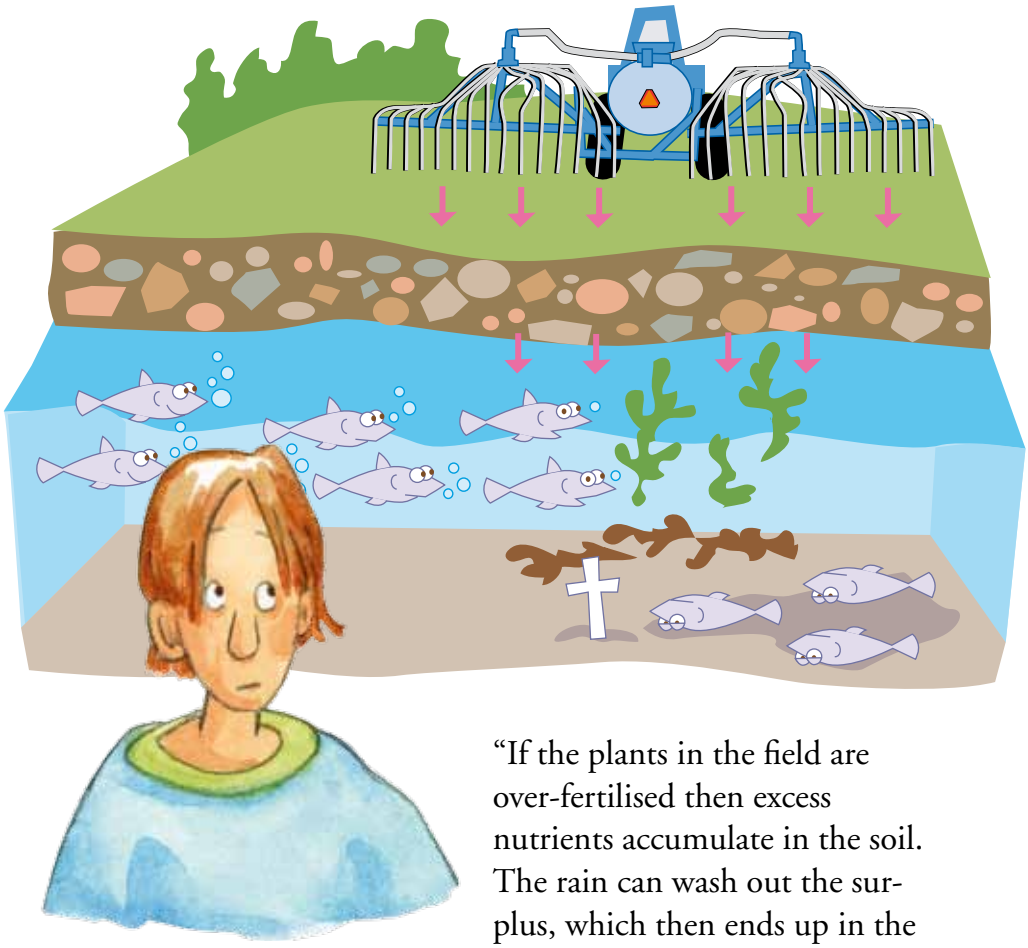
The fish die without oxygen

"Ok, listen up, here's the story", Poul Elo says.
"As you know, there are also plants in the sea. There are different kinds of seaweed and algae, and when nutrients – especially nitrogen and phosphorus – are added to the water the algae really start growing".
"They grow and grow, but then they die and sink to the bottom of the sea, where they start rotting. The rotting process uses oxygen in the water. Without oxygen in the water, the fish can't breathe, and they try to swim elsewhere. If they don't get away in time, they die".
"It's not that weird that they can't breathe under water. I can't either", Jonas says dryly.
"Well, it's different with fish. You have lungs, but a fish has gills", Poul Elo explains while he pulls a flounder from the box and shows where its gills are located.
"Fish breathe using their gills, and they are just as dependent on oxygen in the water as you are of oxygen in the air. If you don't have oxygen, you suffocate and die, and the same is true for the fish", Poul Elo says.
"There you go!" Karin exclaims. She's been listening as well.
"There's the solution to the mystery of what agriculture has to do with fish in the sea".



The Baltic Sea

The Baltic Sea is like a great lake. It is only connected to the other seas and oceans via the narrow Danish straits: the Little Belt, the Great Belt and the Sound.
The water in the Baltic Sea lacks oxygen. A huge storm from the west is necessary to push new salt water with more oxygen through the straits. The water of the Baltic Sea is brackish. It is a mix of salt water and fresh water.
Over time, wastewater from the cities, chemicals from factories and excess nutrients from agriculture from the Baltic Sea countries have heavily polluted the Baltic Sea.



"If the plants in the field are over-fertilised then excess nutrients accumulate in the soil. The rain can wash out the surplus, which then ends up in the sea. The nutrients feed the algae. They grow and grow and when they die, they fall to the bottom of the sea, where they rot. The rotting process uses the oxygen in the water, and without oxygen the fish can't breathe, and then they die too", Karin explains.
"Yes, it's such a sad story! If you talk with any farmers, then tell them from me that they have to do something about it", Poul Elo says. "Your bus is waiting, and I have to go back to the sea to see if I can catch any more fish today", he says.
"What about the fish in the box?" Faruk asks.
"They are all yours, you can take them home", Poul Elo says and puts all the fish in a big plastic bag, which he hands to Karin.
The bus driver waves to them from the shore and shouts that he will be leaving in five minutes. All the children say goodbye to Poul Elo and head to shore with the bag of fish.
"I think we are going to cook fish tomorrow at Food School", Karin says while she carries the bag.

"Oh, look at all these wonderful fish", Katrine, the chef at Amager Faelled School says. She's delighted when she sees the big bag of fish.

"But it's a lot of work to skin and rinse them, so we should get started", she adds.

Simon is on the food team, and his job is to dip the fish in rye flour before they are fried. He has tried it before, but back home the fish were dipped in eggs and breadcrumbs. Katrine doesn't think that is necessary. Flour is just as good.

"We're having chips and relish too, aren't we?" Simon asks. "You can have chips, but it will be the healthy kind", Katrine answers.

"We are going to make chips of celeriac and red beets from Stone Farm and a salad of raw carrots. It's going to be splendid!"

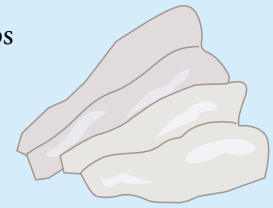
"What a delicious lunch you are going to have", Karin says as she stops by to see how lunch is coming along.

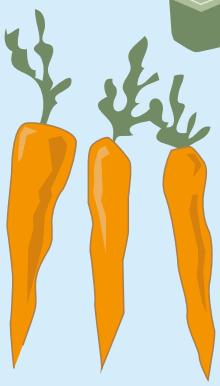
"Fresh flounder caught by Poul Elo in the Baltic Sea and vegetables from Elisabeth and Jens Otto's organic ERA-farm. The food is both local, organic and 'a diet for a clean Baltic'. It couldn't be better", Karin says.

The flounder is being fried. The kitchen smells of wonderful food, and finally Simon begins to understand that 'a diet for a clean Baltic' isn't that silly after all...

'Diet for clean Baltic' School Food

Healthy Fish'n'Chips





Fried fish

Flounder fillets
Rye flour
Salt and pepper
Rapeseed oil for frying

Raw carrot salad

Shredded carrots
Marinade of lemon and honey

Healthy fries

Celeriac, cleaned, peeled, cut into fries
Red beets, cleaned, peeled, cut into fries
Olive oil to bake the fries
Salt, pepper and thyme to season the fries

If you are really cool, you can also make your own relish

Relish

2 tablespoons carrot, finely chopped
4 tablespoons gherkins, finely chopped
3 tablespoons red onion, finely chopped
2 tablespoons parsley, chopped
1 teaspoon Dijon mustard
1 tablespoon apple vinegar
1 tablespoon Greek yoghurt, or ordinary yoghurt
½ teaspoon curry

Directions

Clean, peel and shred the carrots. Mix a marinade of lemon and honey, and add it to the carrots.
Clean and peel the celeriac and red beets. Cut into fries. Mix them with olive oil in a bowl, and add salt, pepper and thyme. Bake them in the oven at 200-225 degrees Celsius until they are golden.
While they are in the oven, you can make the relish. Chop the vegetables. Mix mustard, vinegar and curry with the yoghurt and add the vegetables.
Dip the fish in rye flour mixed with salt and pepper. Add oil to the pan and wait for it to get hot. Add the fish and fry it.

Bon appétit!

Further reading

You can download assignments related to the book at www.videlerethav.dk. You can also download the book in English at www.weshareasea.eu.

The Danish Ecological Council is project manager of the book: www.ecocouncil.dk.

Frugtformidlingen has produced this booklet. Frugtformidlingen disseminates information, and creates events and workshops about food, produce and health: www.frugtformidlingen.dk.

BERAS Implementation has invented the concepts Ecological Recycling Agriculture and "a diet for a clean Baltic": www.beras.eu.

Stone Farm is called Stengården in Danish and is one of three Ecological Recycling Agriculture farms in Denmark: http://www.stengaardenoko.dk/

Amager Faelled School is called Amager Fælled Skole in Danish and has a Food School in real life as well: http://www.afs.kk.dk/

Living Sea, which is called Levende Hav in Danish, is the inspiration for the chapter about Poul Elo: http://levendehav.dk/

THE DANISH ECOLOGICAL COUNCIL

BERAS implementation
Baltic Ecological Recycling Agriculture and Society

Baltic Sea Region

Part-financed by the European Union (European Regional Development Fund and European Neighbourhood and Partnership Instrument)