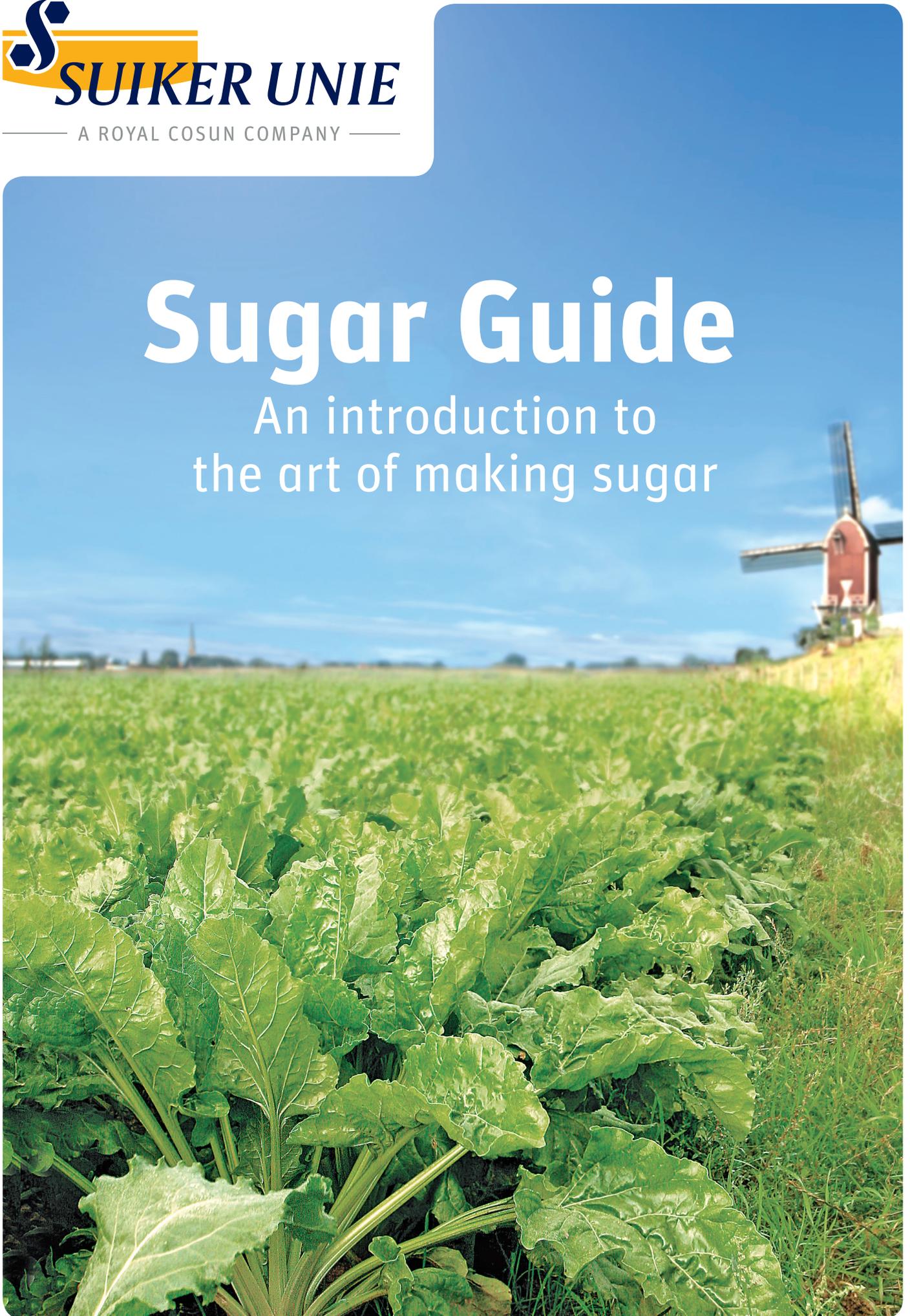


Sugar Guide

An introduction to
the art of making sugar



We are pleased to offer you a glimpse behind the scenes at Suiker Unie. This flyer is your paper guide that takes you through every step of the sugar-making process.

About sugar

Before stepping into the process, we would like to take a look at our finished product: it is impossible to imagine life and cooking without sugar. Sugar enhances the flavour of fruits and vegetables, it is a good source of energy, but above all: sugar is a natural product.

Suiker Unie works closely together with the Sugar and Nutrition knowledge centre (Kenniscentrum suiker & voeding), the scientific knowledge centre in the area of nutrition and health for the Dutch sugar industry.

Dressings, marinades, chocolate, dairy products, biscuits and pastries, soft drinks... All of these products contain sugar. The major part of the sugar of Suiker Unie goes to industrial clients; among them the producers of the products mentioned above.

There are many different types of sugar: granulated sugar, sugar cubes, soft sugar, candy sugar and icing sugar. These products are delivered to supermarkets under the Van Gilse brand name, and also to the catering industry and wholesale trade.

KENNISCENTRUM
suiker & voeding

www.kenniscentrumsuiker.nl



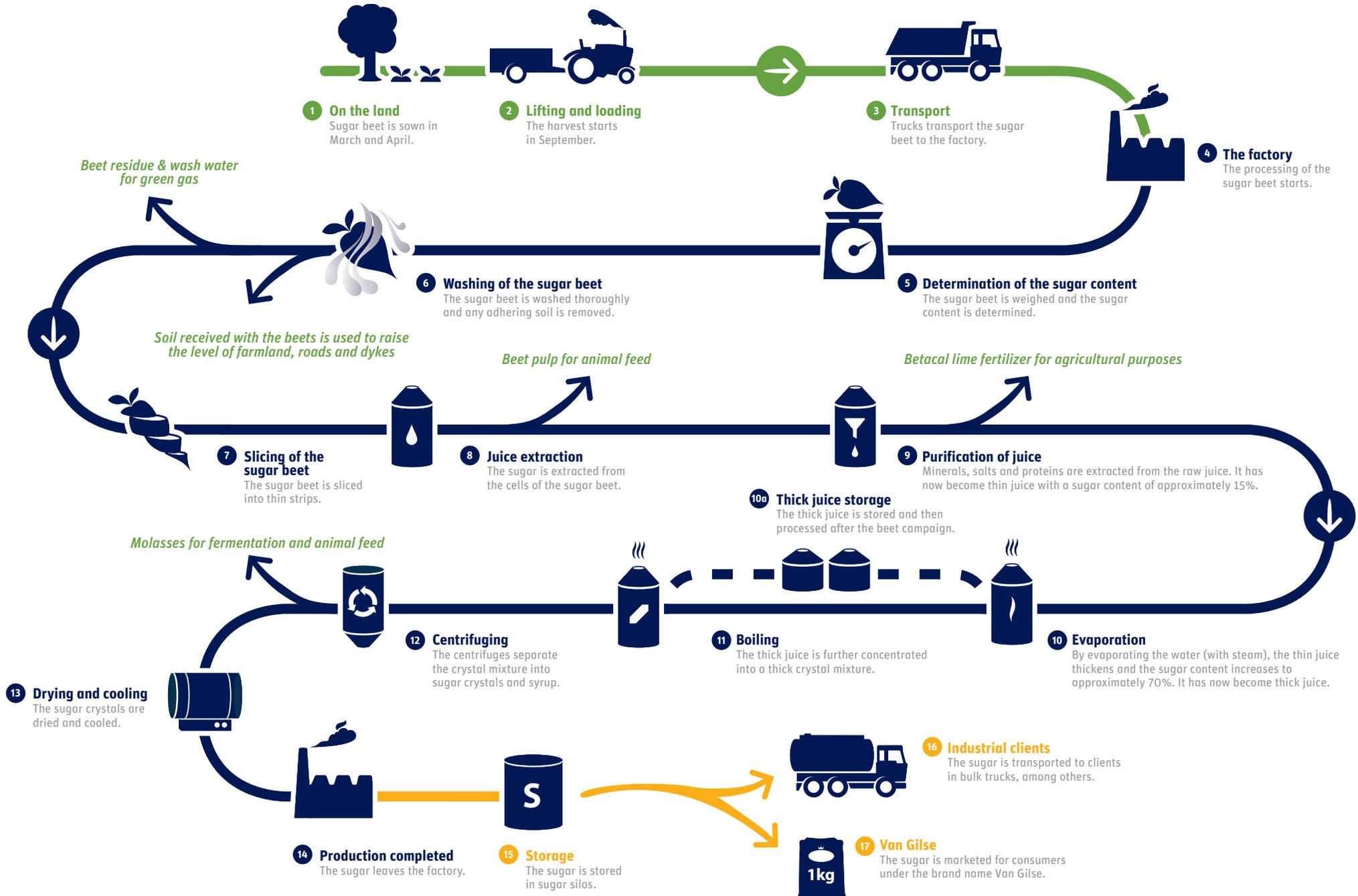
www.vangilse.nl



Key figures

- Suiker Unie has two sugar factories in the Netherlands (Dinteloord in the South and Vierverlaten in the North) and one sugar factory in North-East Germany (Anklam).
- Two factories (Puttershoek and Roosendaal) produce specialties such as sugar cubes, soft sugar, icing sugar and liquid sugar products.
- Suiker Unie has 750 employees, of which 200 in Germany.
- Suiker Unie forms part of Royal Cosun, a cooperative of approximately 9,000 sugar beet growers.
- Sugar beet is grown on approximately 86,000 hectares of land in the Netherlands.
- The campaign runs from early September to late January.
- Suiker Unie produces more than a million tonnes of sugar per year.

Production process





← *The steps illustrated here show the production process in a nutshell.
See text below for more information.*

1 2 Sowing and harvesting of sugar beet

In March and April, sugar beet seed of the highest quality is sown on 86,000 hectares of land. With a minimum use of fertilizers and plant protection products, this seed grows to produce the desired sugar beet. In September, the time is ripe to harvest the sugar beet. The tops with the leaves are removed from the sugar beet on the land. This reduces the transport volume and it benefits the environment.

3 Delivery to the sugar factory

Our growers make an effort to deliver the sugar beet as 'clean' as possible. The removal of soil considerably reduces the weight and consequently the fuel consumption during transport towards the factories of Suiker Unie.

4 5 Determination of sugar content

After arrival at the factory, the sugar content of the sugar beet is determined, as well as the extractability of the sugar and the amount of tare (leaves and soil received with the sugar beet).

6 7 Washing and slicing of the sugar beet

In the factory, Suiker Unie washes the sugar beet to remove the adhering soil. This soil is used to raise the level of farmland, construction of roads and dyke reinforcement. Subsequently, Suiker Unie removes the tails of the sugar beet. Together with the washing water and the other vegetable residues, these tails are converted into green gas which is used, for instance as energy in the factory and as fuel for the bulk trucks for sugar transport. After washing, the sugar beet is fed into the slicer. Here they are sliced into thin strips called cossettes.

8 Juice extraction

The sugar is dissolved in the cells of the sugar beet. To extract the sugar, the diffusion tower of Suiker Unie heats the cossettes. The cossettes are slowly conveyed upward, releasing the sugar into the water. This results in raw juice with a sugar concentration of approximately 14%. The remaining beet pulp is sold as animal feed, either in pressed or dried form (pellets).



Suiker Unie Dinteloord



9 10 Juice purification and condensation

10a Apart from sugar, the raw juice also contains minerals, salts and proteins. These are extracted, purifying the raw juice into thin juice. In this process, calcium carbonate is released; a natural lime fertilizer (Betacal) that improves the soil structure.

Thin juice contains approximately 15% of sugar. After heating with steam (evaporation), the juice is concentrated and the sugar percentage increases to 70%. This is called thick juice. To work flexibly throughout the year, some of the thick juice is stored in dedicated tanks at the factory. It is processed into granulated sugar after the beet campaign.

11 12 Boiling and centrifuging

In the boiling station, the thick juice is further concentrated in large, vacuum pans until it is saturated with sugar. The continued evaporation of the water causes the sugar to crystallize. On further evaporation of this crystal mixture, the crystals continue to grow until they reach the desired size. A centrifuge presses the crystal mixture (syrup) through a sieve, as a result of which crystal-clear crystals stay behind. The syrup that remains in the end is called molasses and is used as raw material for the fermentation industry and animal feed.

13 14 **Drying, cooling,** 15 16 **storage and further processing**

17 Subsequently, the sugar crystals are dried and cooled. After that, it is time to store the sugar for shipment to clients, to pack it in consumer packages or to further process it, for instance into sugar cubes. The sugar is ready for use!

Suiker Unie greatly values sustainable business practices. We continuously strive to improve the sustainability of our processes and products. All of the sustainable activities carried out by the various Royal Cosun companies come together in the sustainability programme, which consists of three pillars: **Good stakeholderhip - Care for people, Sustainable Sourcing & Agriculture** and **Environmental Sustainability**.

Good stakeholderhip – Care for people

Suiker Unie is committed to the quality and sustainability of the entire chain – from sugar beet cultivation to the delivery of sugar and other products. We collaborate with our chain partners and consult with our stakeholders. Customer focus, continuity of our beet cultivation, and sustainable production and logistics are our top priority.

Suiker Unie wants to be socially involved and take care of its immediate environment. We consult the people around us and focus on societal themes that align closely with our fields of expertise. Our motivated and highly trained employees work together in a productive atmosphere with the aim of achieving our ambitions and looking to the future.

Sustainable Sourcing & Agriculture

In the Netherlands, sugar is derived from sugar beets, which grow well in our climate. The leaves are aboveground and capture the sunlight necessary for the production of sugar. The sugar we harvest is 100% natural with no

additives, thereby constituting an excellent source of energy. Suiker Unie is committed to protecting the natural environment and practising sustainable beet cultivation by promoting biodiversity, soil management, and landscape maintenance. Cultivation and conservation go hand in hand.

Environmental Sustainability

Suiker Unie aims to strike the right balance between sustainability and efficiency throughout the entire operational chain. We use natural resources carefully and mindfully. We work hard to conserve energy, improve efficiency, minimise emissions, and produce our own green energy.

Suiker Unie looks to the future and tries to maximise its use of raw materials based on the principles of the circular economy. We also try to maximise our valorisation process and our use of production residues by using organic residues to produce green gas, among other things. All organic residues and minerals should be restored locally as much as possible.



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