

Fresh and healthy from the lettuce factory

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30 Later this year, the first commercial 'vertical farm' in Europe will be opened. The Staay Food Group, a fresh fruit and vegetables company, will produce lettuce in a new production plant, in Dronten, the Netherlands. The facility will serve one of Europe's largest supermarket chains, Aldi.

It took almost three years of preparation. The Staay Food Group, Philips Lighting and vegetable breeder Rijk Zwaan collaborated and undertook intensive research to determine the best combination of lettuce varieties and growth recipes in order to improve crop quality and yields. Having the right growth recipe ready prior to the start of operations at the vertical farm will help Staay achieve a faster return on investment. "Yes, it is an expensive system of growing lettuce," says Marc Celis, crop consultant at Rijk Zwaan and specialist in hydroponics. "But it has many advantages."

Benefits

In Europe, vertical farming is a new phenomenon. So far, only research institutes held trials. In South East Asia, however, it is the only way to produce lettuce. "The high temperatures in the tropics are no obstacle for growing lettuce, if you do it in a closed system, where the climate is regulated. Before, the lettuce had to be imported from Australia and that made it

'You can avoid all pesticides'

a very expensive vegetable," explains Marc Celis. North America also has some vertical farms, mostly to avoid the long-distance transport from California to the East Coast. But there are more benefits than the local for local production. "In a vertical farm, the products don't need any plant protection measures, but strict hygiene. It means you can avoid all pesticides, and therefore no residues, but it also means much lower bacterial count as there is no contamination."

An extra advantage at the Staay production plant in Dronten is that packaging is done on site. "We are building a new plant for FreshCare with an in-house vertical farm," says Rien Panneman, CEO of Staay Food Group. "Our customer, Aldi, has stimulated this development." At FreshCare, potatoes, fruit and vegetables are cut and processed into a limited range of fresh produce that makes its way to the supermarkets in Europe each day. Aldi has over 10,000 stores in 18 countries. Together with the low bacterial count, the in-house production ensures that the lettuce has a longer shelf life at the retailers.

"Also, by avoiding weather fluctuations, we maintain

an optimized and stable production environment to guarantee consistent and optimal product quality." He is convinced that vertical farming will become profitable in due course. "The difference in cost price will decrease. And besides the quality aspects, it is also environmentally friendly. In winter, we have to import lettuce from Southern Europe, but with a vertical farm we can produce it here. It also helps that the fresh convenience market share is growing rapidly; the supermarkets carry ever more fresh salads and salad meals. We hope that our vertical farm will become a catalyst to local-for-local production of vegetables."

Indoor farm

The 900 m² indoor vertical farm will have over 3,000 m² of growing space. "Compared to open field growing, the yields are remarkably high. On 1 hectare of land, you can grow 100,000 lettuce plants per year. On the same surface of gutters in a vertical farm, 3 million lettuce plants can be produced. And they can be precisely programmed to be ready for harvest at a pre-set date, preventing both waste as well as shortages." It is also a sustainable technique, as there is minimal water loss and the use of electricity is limited. The light source is from Philips Lighting, whose researchers trial a variety of crops at its research centre GrowWise under different LED lighting and climate conditions to help establish their economic potential. "And the varieties come from Rijk Zwaan. We had to determine which varieties would flourish in the special conditions in a vertical farm and also which varieties offer the best taste and texture. The varieties should not be susceptible to tipburn or bolting. The temperatures in a vertical farm are relatively high compared to the amount of light. Furthermore, the light is less strong than sunlight and the day-length longer. Not all varieties are suited to an 18-hour LED-day." Most lettuce types react well to vertical farming, romaine and iceberg lettuce are the only exceptions.

Hydroponics

Growing on water has become fairly common. "I spend 90% of my time consulting lettuce growers on hydroponic systems. In Scandinavia and Russia, 95% of the lettuce is grown on water. In Belgium, that is 15% to 20% and in the Netherlands the area is