THE SUSTAINABLE POULTRY SHED

Luuk Vissers did doctoral research on a sustainable shed for broiler chicks which improves animal welfare and reduces emissions of ammonia and particulates.

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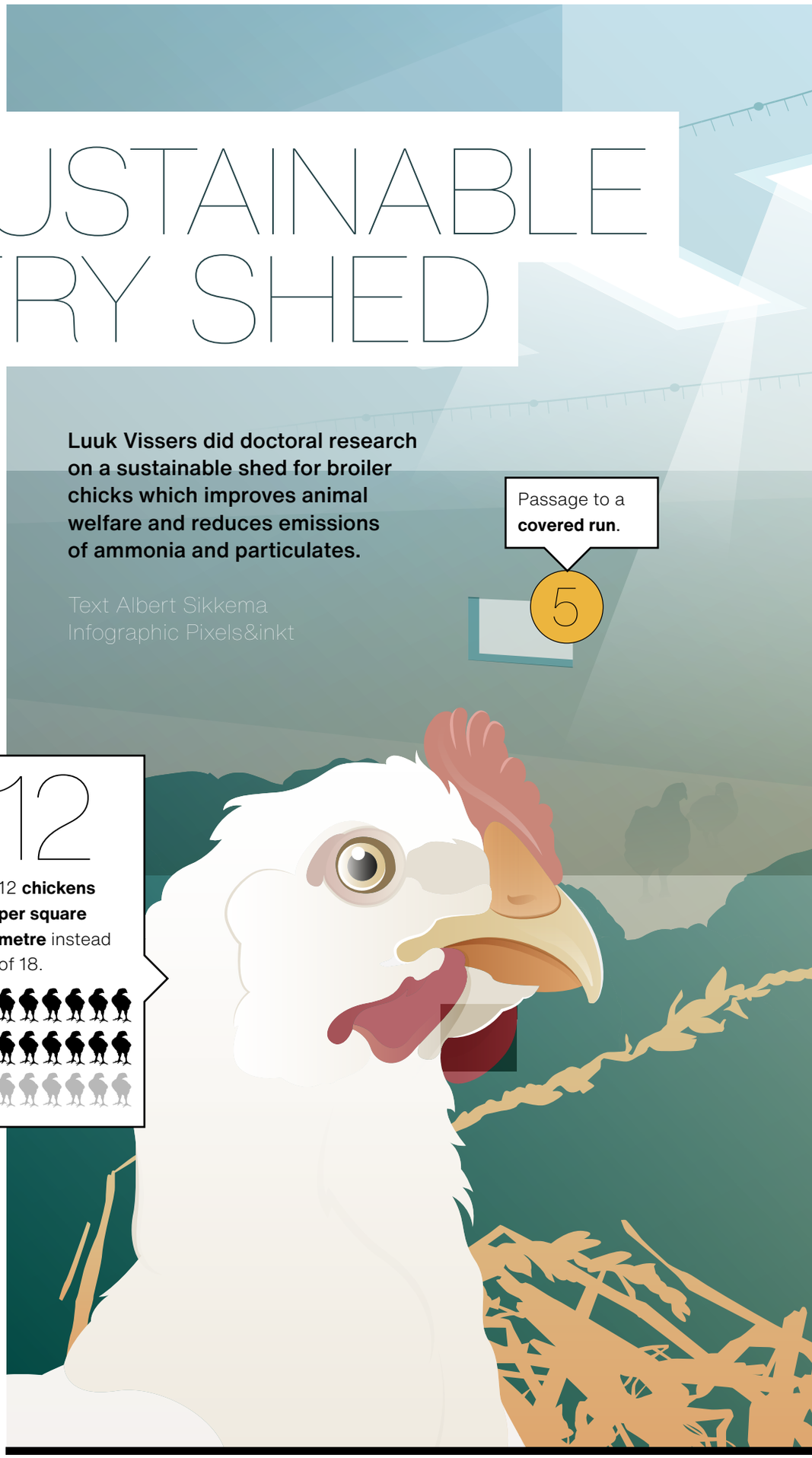
Infographic Pixels&inkt



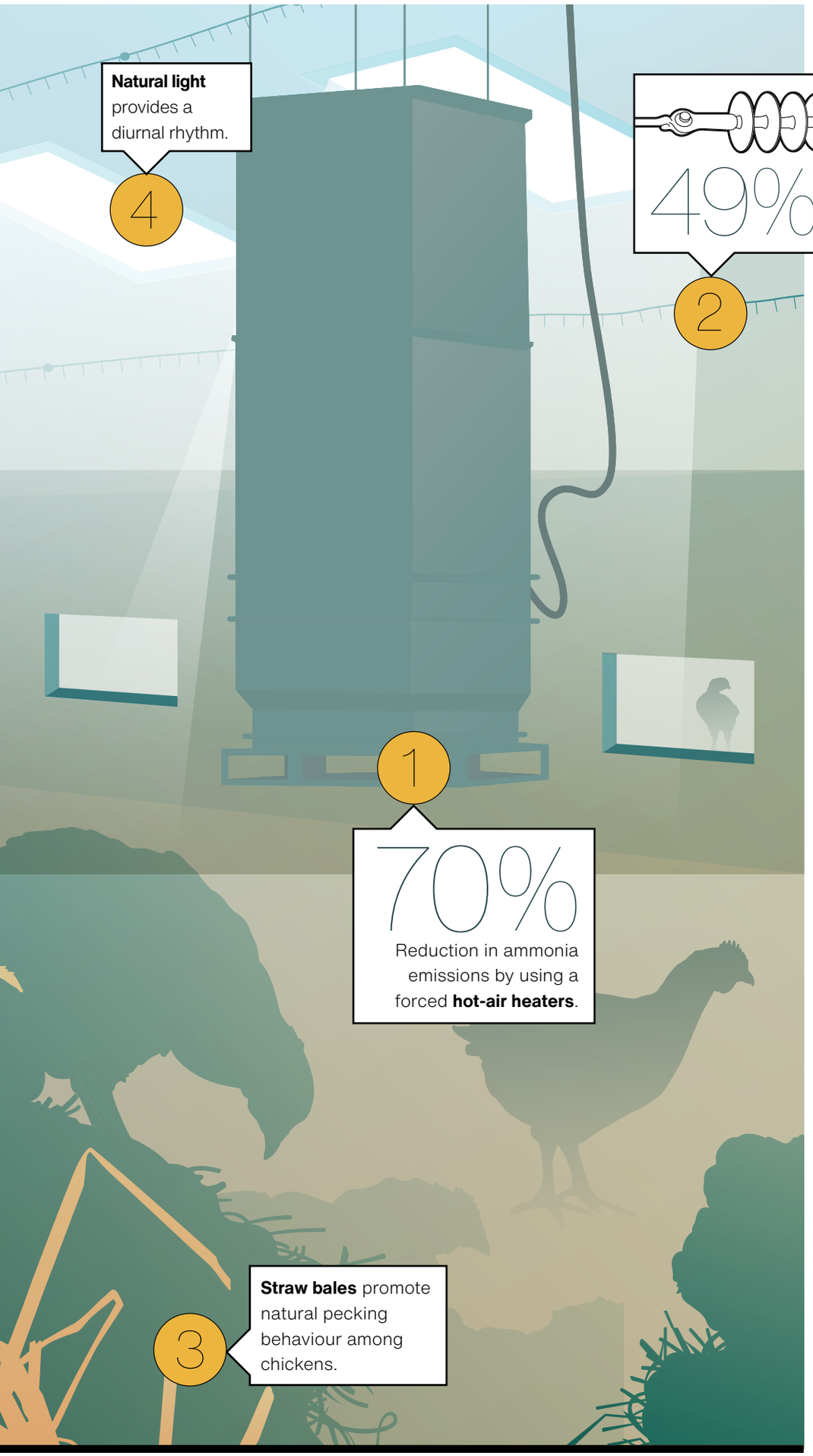
Many Dutch broiler farmers are going to have to modify their sheds in the next year or two because from 2023 Dutch supermarkets want to sell only chicken with the Beter Leven (Better Life) quality label. This means farmers must introduce welfare measures and can keep fewer chickens per square metre (12 instead of 18). They will also have to meet stricter criteria on levels of ammonia and particulate matter. How can they best do all this? Luuk Vissers looked for integrated solutions.

1 Ammonia

The broilers excrete on a floor covered with litter. This litter binds ammonia when it is dry; wet litter causes increased ammonia emissions. Broiler farmers can dry the litter with forced hot-air heaters or piped heating, potentially reducing ammonia emissions by up to 70 per cent. This has the added advantage of improving the climate in the shed: less ammonia is healthier for both farmer and chickens. The alternative, an air filter, is more expensive and does not provide that health benefit.

2 Fine particles

The litter that binds ammonia produces a lot of fine particles. There are ionization techniques to capture these: the farmer installs steel wires and applies a high voltage. This makes the dust particles stick to earthed surfaces such as floors and walls, and the farmer can reduce particulate emissions by up to 49 per cent. An additional welfare benefit is



that the barn climate improves. Should halving emissions be insufficient, the farmer can combine this technique with an air filter, yielding a reduction in particulate emissions of 84 to 87 per cent. The air filter captures ammonia as well, but it is an expensive option.

3 Straw bales

One of Beter Leven's welfare measures is placing bales of straw in the shed so that the chickens can display their natural pecking behaviour. This will lead to a (slight) increase in their activity levels, kicking up more fine particles.

4 Natural daylight

Natural light and a diurnal rhythm have a positive effect on the welfare of the chicken. That is why the Beter Leven label requires natural daylight in the shed. This measure also makes the chickens more active, leading to higher particulate emissions.

5 Covered runs

No studies have measured the effect of free-range housing on ammonia emissions, Vissers says. Free-range farming methods can increase emissions, but this depends on many factors, including temperature, humidity and wind direction. There is a need for ammonia sensors in and around the barn to measure this.

Conclusion

The combination of fewer hens per square metre, tube heating, electrified wires, natural daylight and straw bales can reduce ammonia emissions by 66-73 per cent and particulate emissions by 41-61 per cent. But these measures and investments increase the costs incurred by broiler farmers such that they would need to raise their selling price by 19 per cent, Vissers says.