

Artificial meat

Hamburger junction

- 1 **A** QUARTER of a million euros is rather a lot to pay for a hamburger, but that will be the cost of the patty which Mark Post proposes to stick in a bun this October. The burger in question – not so much a quarter-pounder as a quarter-million-pounder – will be so expensive because it will be made from meat that has been grown from scratch in a laboratory.
- 2 Dr Post, who works at Eindhoven University in the Netherlands, belongs to a group of people who hope to disrupt one of mankind's oldest industries – animal husbandry. In fact, they wish not so much to disrupt it as to destroy it.
- 3 Raising animals is a resource-intensive process. About 30% of the world's ice-free land is used for it. Yet of the nutrients in the plants these animals eat, only around 15% is turned into meat. As the human population grows, and grows richer, demand for meat is increasing. Dr Post hopes to satisfy at least part of that demand by making the stuff in factories, in a way that converts about 50% of the nutrients into something people can eat.
- 4 For now, that something is not exactly fillet steak. Dr Post's cultures, grown from stem cells, are sheets 3cm long, 1.5cm wide and half a millimetre deep. To make the world's costliest hamburger 3,000 of them will be needed.
- 5 The stem cells themselves are extracted from cattle muscle and then multiplied a millionfold before they are put in Petri dishes and allowed to turn into muscle cells. When they have done so, they are encouraged to exercise and build up their strength by being given their own gym equipment (pieces of Velcro to which they can anchor themselves in order to stretch and relax spontaneously). The fatty cells of adipose tissue, needed for juiciness, are grown separately and then combined with the muscle cells before the whole thing is cooked. In theory, one cow could thus supply as many hamburgers as a million slaughtered animals can today.
- 6 Producing meat in Petri dishes is not commercially viable, but Dr Post hopes to scale things up – first by growing the cells on small spheres floating in tanks and ultimately by using scaffolds made of biodegradable polymer tubes, which would both add the third dimension needed for a



juicy steak and provide a way of delivering nutrients and oxygen to the steak's interior.

- 7 The nutrients themselves could come from conventional crops, but Dr Post also has plans to use algae, which grow faster than vascular plants, to provide the necessary amino acids, sugars and fats. The upshot would be a world with fewer stock animals. Not only would that liberate land, it would reduce greenhouse gas emissions (cattle are notorious sources of methane, which is a much more potent greenhouse gas than carbon dioxide). Moreover, you do not even have to kill a cow to obtain stem cells from it. A biopsy will do. That might mean that vegetarians would be able to enjoy meat too.

The Economist, 2012

Tekst 8 Hamburger junction

- 1p 32 What is the function of paragraph 2?
- A To discredit the scientists responsible for the investments in artificial food research.
 - B To introduce the motive underlying the research into cultured meat.
 - C To warn against research that is damaging to agricultural economics.
- 1p 33 What becomes clear from paragraph 3?
- A A pressing need for meat is stimulating the industrial production of its alternatives.
 - B Dr Post's burger has been engineered to improve animal welfare.
 - C Lab burgers are meant to be more efficiently produced than conventional meat.
- 2p 34 Geef van elk van de onderstaande beweringen aan of deze wel of niet overeenkomt met de inhoud van alinea 5.
- 1 The new technology involves slaughtering animals.
 - 2 The muscle cells have been genetically modified.
 - 3 Adding fat cells makes in-vitro meat more succulent.
 - 4 Cultured beef could be the answer to a major problem that the world faces.
- Noteer het nummer van elke bewering, gevolgd door "wel" of "niet".
- 1p 35 What point is made about the production of artificial meat in paragraph 6?
- A Large-scale manufacture hinges on building systems that optimise production methods.
 - B More time is needed before consumers will be used to the idea of synthetic meat.
 - C The cell culture process should resemble organic growth more than it currently does.
 - D The funding needed to make the process profitable is one of the biggest obstacles.
- 1p 36 "vegetarians would be able to enjoy meat too" (laatste zin alinea 7)
Wordt deze gedachte eerder aan de orde gesteld?
Zo nee, antwoord "Nee". Zo ja, noteer het nummer van de betreffende alinea.

Bronvermelding

Een opsomming van de in dit examen gebruikte bronnen, zoals teksten en afbeeldingen, is te vinden in het bij dit examen behorende correctievoorschrift, dat na afloop van het examen wordt gepubliceerd.