

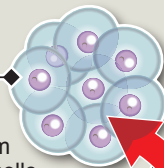
Cow-free burgers grown in the lab

Meat grown from cultured cells – so-called “clean meat” – is made by taking muscle tissue from an animal, collecting stem cells from the sample and multiplying them dramatically into strands of muscle tissue



1 Small biopsy is taken from animal under anaesthesia

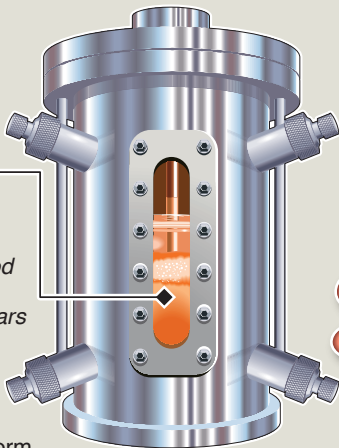
2 Myosatellite cells: Stem cells of muscles are separated from sample. Satellite cells are used to produce cell starter culture



3 Cell proliferation:

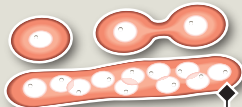
Cells transferred to bioreactor along with growth factors, which cause cells to multiply

Bioreactor: Growth medium is warmed to body temperature (37 degrees Celsius), 5% CO₂ to mimic blood carbon dioxide levels, plus oxygen, salt, sugars and growth factors



4 Cellular differentiation:

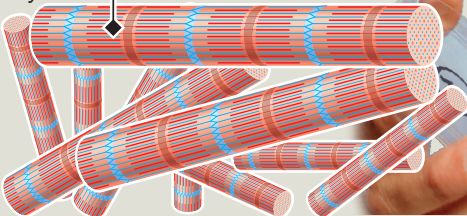
Signalling molecules (proteins) added to growth medium make cells differentiate into muscle, fat and connective tissue



Muscle cells merge to form **myotubes** – 0.3mm-long fibres

5 Myotubes spontaneously contract and align to form myofibrils, muscle fibres, fibre bundles, and finally small strands of muscle tissue

Myofibrils



6 Around 10,000 strands needed to produce 100 grams of meat which can be processed using standard technologies

