

CASSAVA PROCESSING TRAINING MANUAL

HIGH QUALITY CASSAVA FLOUR (HQCF)

RAW MATERIAL: CASSAVA ROOTS

Process

- Harvest mature roots
- Weigh all raw material

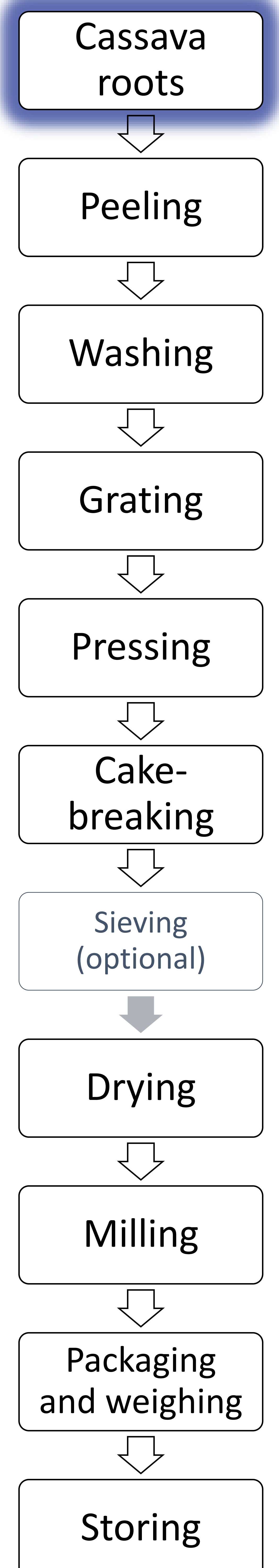
Equipment

- Sharp implements for harvesting
- Calibrated balance/scales for weighing before and after processing

Tips

- Avoid immature, old, diseased, fibrous or woody roots
- Avoid damage during harvesting
- Process harvested roots within 24 hours for best quality and maximum recovery of processed products

Depictions



PEELING

Process

- Top and tail, and peel the roots using a sharp knife/peeler
- Remove the outer brown skin and inner thick cream layer
- Remove any diseased or woody parts from the roots
- Place the peeled roots in clean bowls of water or wash tank

Equipment

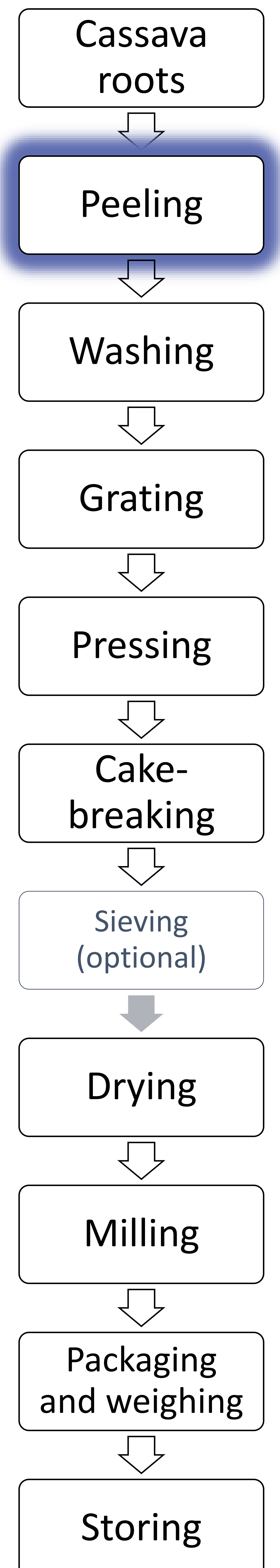
Clean, sharp edge stainless steel knife (sharpen and visually check blades on a regular basis)

- Clean containers or wash tanks/basin

Tips

- Be careful, do not remove too much peel to avoid too much wastage. Weigh all peels and gradeouts
- Grating and peeling can be done at the same time
- Peeled roots should not be left more than an hour in washing water to avoid fermentation

Depictions



PEELING: MOTORISED MECHANICAL

Process

- Top and tail the roots
- Remove any diseased or woody parts from the roots
- Operate peeling machine with batches of topped/tailed roots
- Place peeled roots in clean water
- Manually trim unpeeled areas

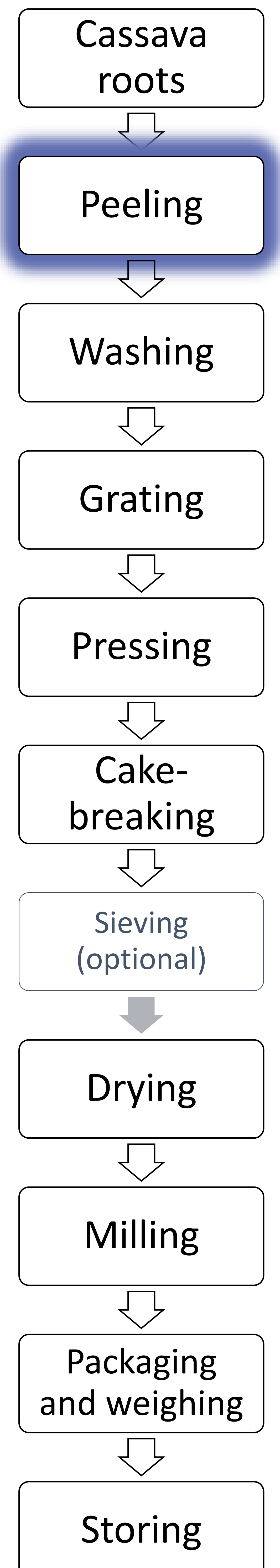
Equipment

- Clean, sharp edged stainless steel knife
- Clean water source
- Peeling machine
- Collection bowl/tank for roots/waste

Tips

- The peeling machine should not remove more waste than manual peeling- avoid wastage! Weigh all peels and gradeouts
- Grading prior to peeling - can be done at the same time
- Do not leave peeled roots for more than an hour in washing water to avoid fermentation

Depictions



WASHING

Process

- Manual or semi-automatic
- Place peeled roots in clean water
- Wash roots until all soil is removed, changing the water 2 to 3 times, or until clean
- Transfer clean roots to clean container or clean surface

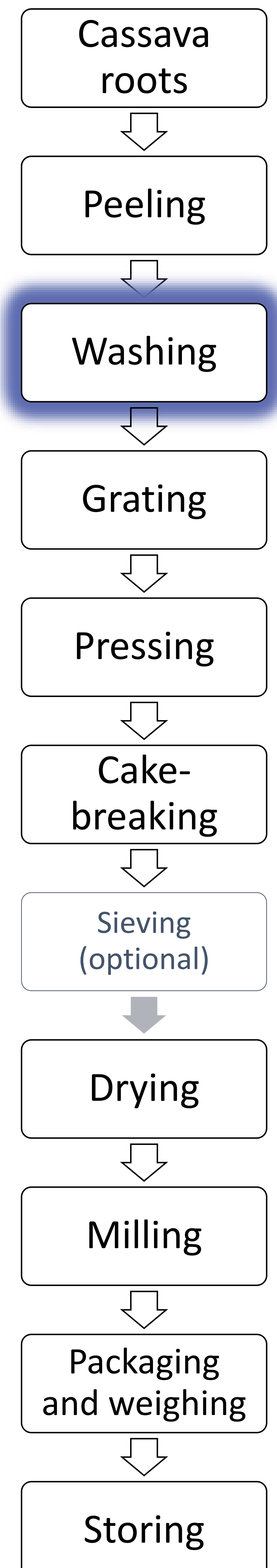
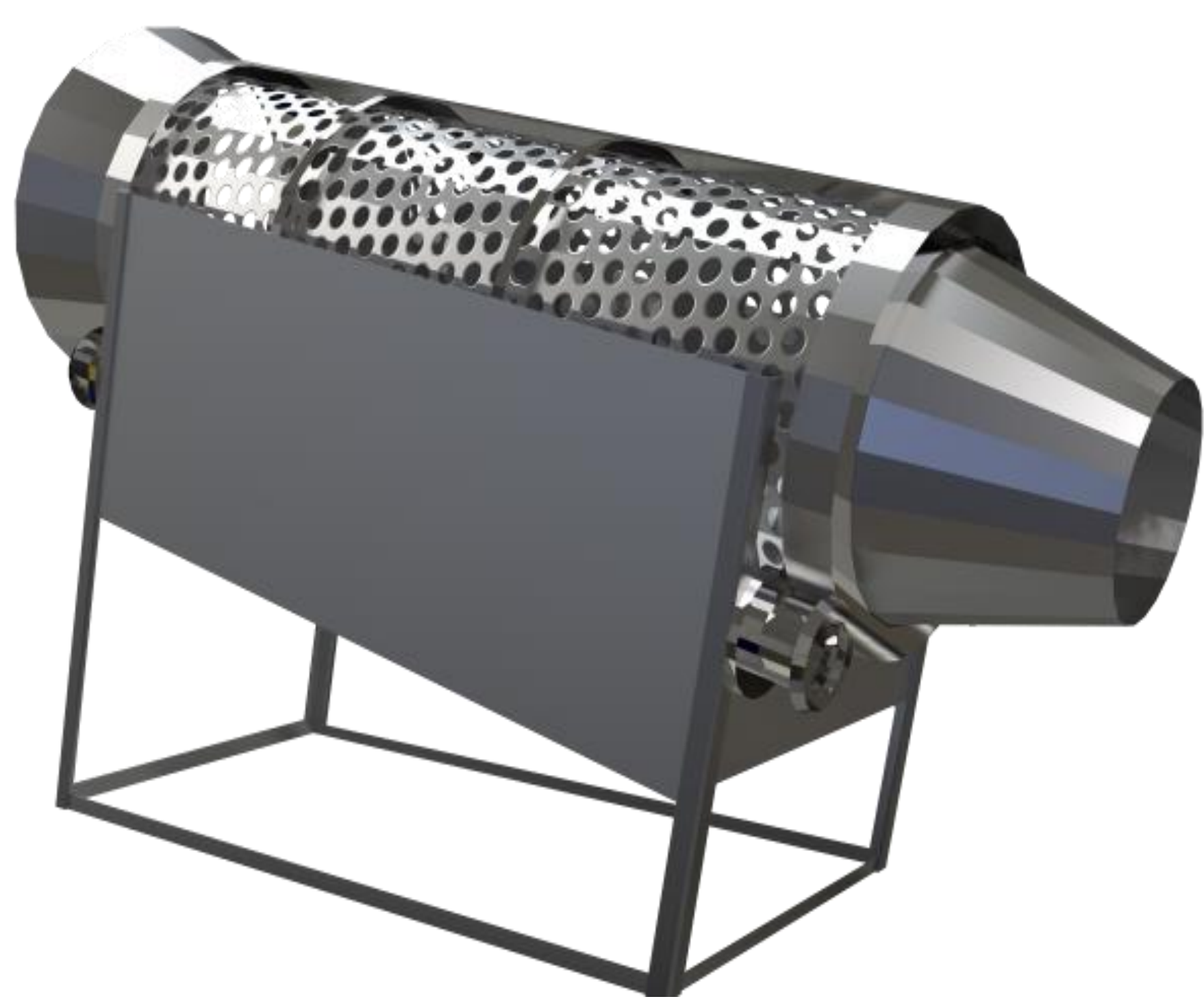
Equipment

- Clean water source
- Basin, wash tank
- Scrubbing brush (optional)

Tips

- Do not leave cassava roots in water for more than an hour to avoid fermentation
- Wash roots soon after peeling to avoid discoloration and maximize whiteness of processed product

Depictions



GRATING OR WET MILLING

Process

- Turn on the grater or wet mill and run water through it to clear any surface dirt and provide lubrication to the abrasive drum
- Ensure there is a clean collector to discharge the pulp into
- Place washed roots into grater or wet mill until batch is complete

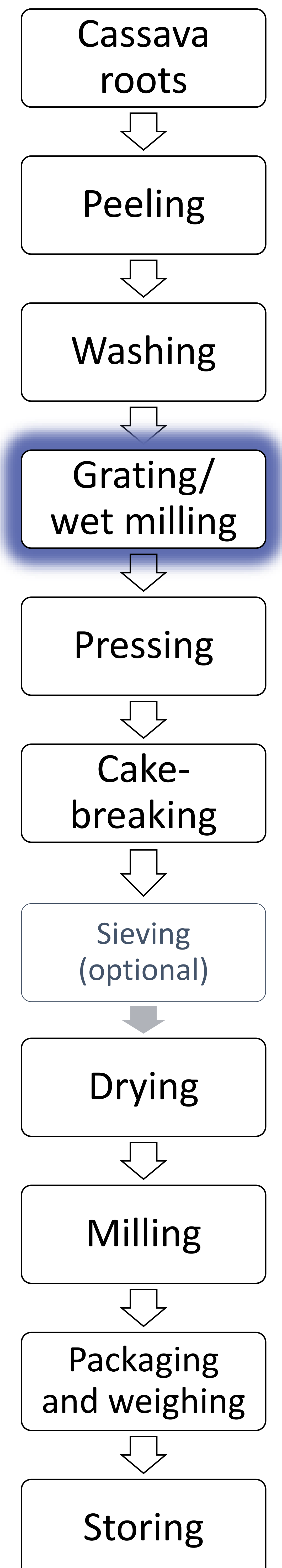
Equipment

- Grater or wet mill
- Collector or clean basin
- Small bowls for moving pulp

Tips

- Ensure equipment is maintained or regularly serviced
- Ensure abrasive grinding drum is sharp
- Clean machine after each use and store in hygienic conditions
- Wet milling produces a finer pulp and may improve recovery rates

Depictions



PRESSING (DEWATERING)

Process

- Place standard amounts of grated pulp into clean propylene (or other porous) bags
- Place each bag in turn into the press Place wood or metal plate underneath the jack (where used) before jacking and pressing operation
- For high quality cassava flour (HQCF) press a fully loaded press for 1.5 hours

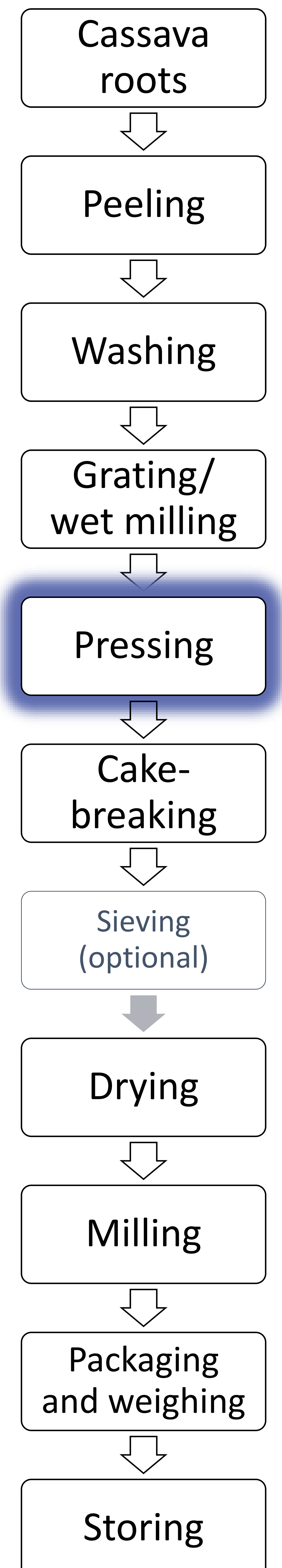
Equipment

- Press cage and hydraulic jack (30t or 50t), screw press
- Porous pressing bags (e.g. PP sugar bags)
- Small bowls for moving pulp into pressing bags
- Other options e.g. centrifuge are available

Tips

- For optimum dewatering, load bags equally with 15Kg maximum of pulp for HQCF
- Flatten bags across the press cage and stack
- Load the corners with wood as the cage is filled
- Ensure jack is operated by trained staff
- Clean press and jack after each use and place in clean store

Depictions



CAKE BREAKING (PULVERISING)

Process

- Remove pressed cake from bags and onto a clean surface or container
- Turn on the grater or wet mill and run water through it to clear any surface dirt and provide lubrication to the abrasive drum
- Ensure there is a clean collector to discharge the pulp into
- Load cake into grater

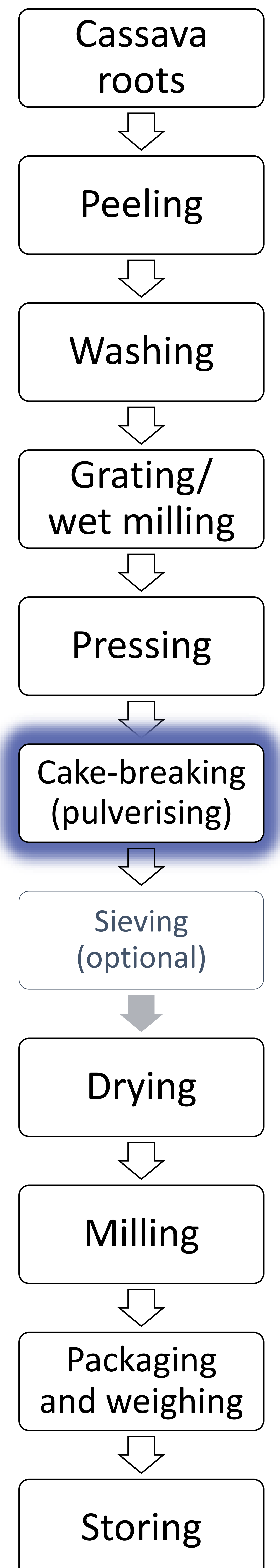
Equipment

- Clean containers
- Grater

Tips

- Ensure equipment is maintained or regularly serviced
- Ensure abrasive grinding drum is sharp
- Clean machine after each use and store in hygiene condition

Depictions



SIEVING

Process

- Use a scoop or bowl and place pulverised cake into a sieve tray and manually shake into a bowl, or onto clean surface
- Periodically remove residual clumps from sieve, adding more cake to the sieve when required

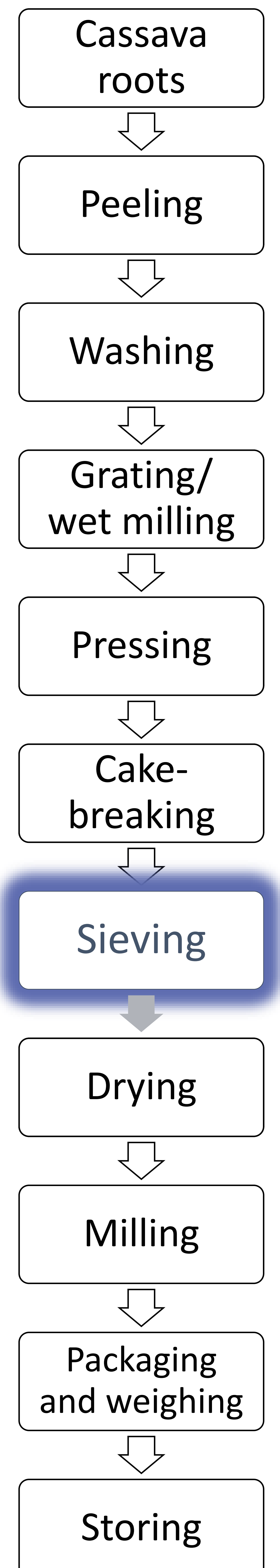
Equipment

- Clean scoop bowl/containers
- Sieve (preferably stainless steel where in contact with product)

Tips

- Wash sieve in clean water after each use and store in hygiene condition

Depictions



SUN DRYING

Process

- Place tarpaulin over the drying platform
- Spread product across the tarpaulin (thinly for High Quality Cassava Flour; HQCF). Sifting can take place whilst spreading
- Dry under sun until product is dry to the hand (10-12% moisture content)
- Ensure there is a clean container or bags to load dried product

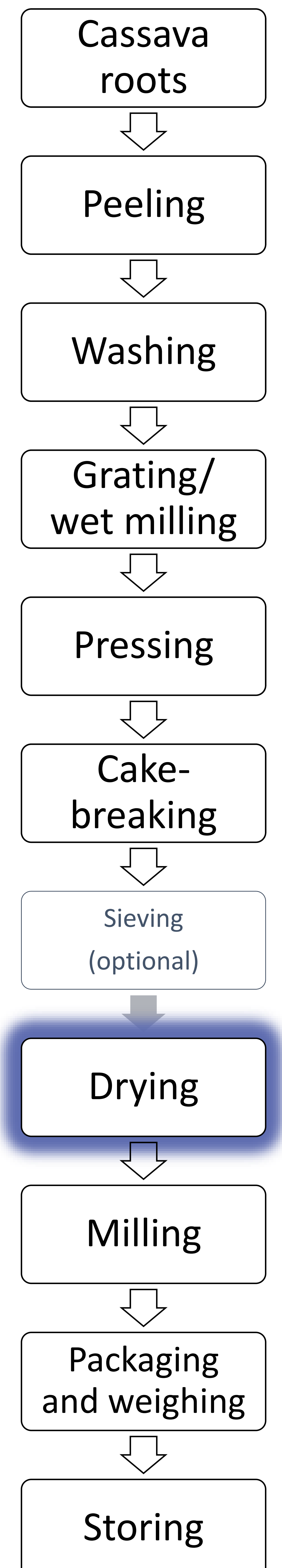
Equipment

- Raised drying platform
- Black tarpaulin
- Sieve (optional)
- Scoop or bowl for spreading/collecting
- Bags or other container for collecting dried product

Tips

- For HQCF load cake maximum 5Kg per square meter
- Ensure drying platforms are maintained in good condition
- Periodically treat wooden platform for termites
- Clean tarpaulin regularly and store in clean condition

Depictions



SOLAR DRYING

Process

- Spread product across the drying surface (thinly for High Quality Cassava Flour; HQCF). Sifting can take place whilst spreading
- Dry until product is dry to the hand (10-12% moisture content)
- Ensure there is a clean container or bags to load dried product

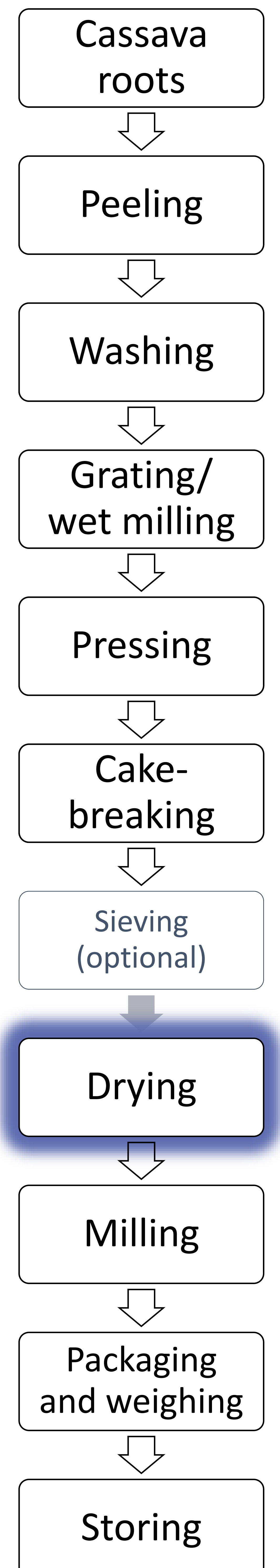
Equipment

- Drying platform
- Sieve (optional)
- Scoop or bowl for spreading/collecting
- Bags or other container for collecting dried product

Tips

- For HQCF load cake maximum 5Kg per square meter
- Ensure drying platforms are maintained in good condition
- Clean solar dryer regularly

Depictions



ARTIFICIAL (BATCH) DRYING

Process

Spread product across the drying surface (thinly for High Quality Cassava Flour; HQCF)

- Dry until product is dry to the hand (10-12% moisture content)
- Ensure there is a clean container or bags to load dried product

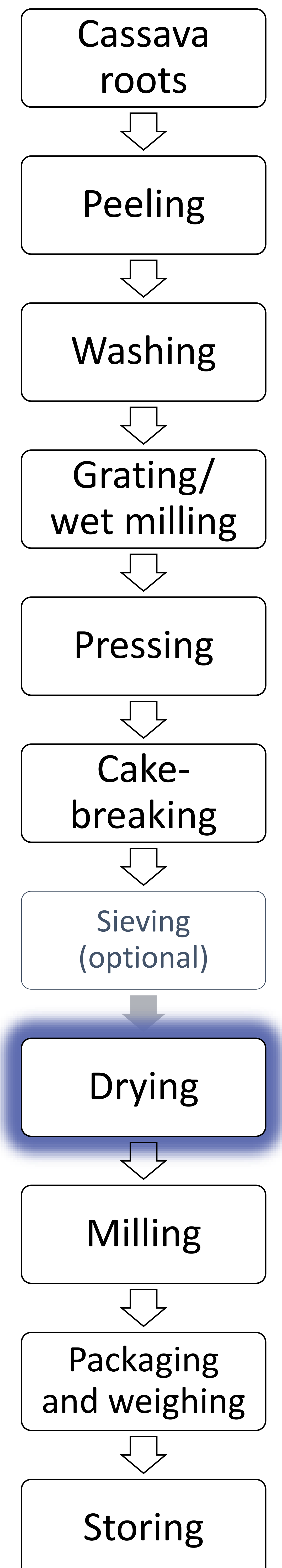
Equipment

- Tray cabinet dryer or tunnel dryer
- Scoop or bowl for spreading/collecting
- Bags or other container for collecting dried product

Tips

- For HQCF load cake maximum 5Kg per square meter in tray dryer
- Clean dryer after and before each use

Depictions



MILLING

Process

- Switch the mill on
- Pour the dried cassava into the mill
- Ensure there is a clean container or bags to load dried product
- Allow product to cool

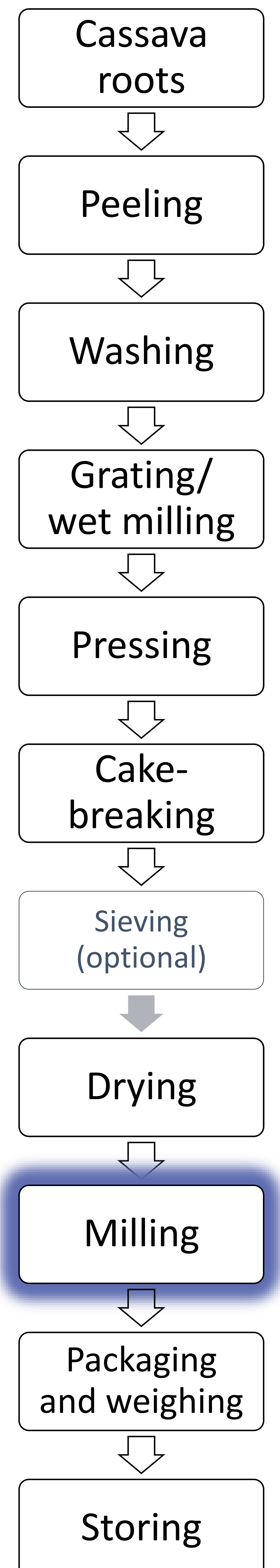
Equipment

- Milling machine
- Mill screen with desired aperture
- Bags or other container for collecting dried product

Tips

- Ensure equipment is cleaned after each use, particularly after milling other products
- Ensure equipment is maintained or regularly serviced
- Store mill in hygienic conditions

Depictions



PACKAGING

Process

- Transfer cooled product into clean propylene or other suitable packaging
- Fill bags to a standard weight and weigh
- Label the bags with the production date
- Seal bags prior to storage and/or seal prior to marketing
- Label packaging prior to marketing

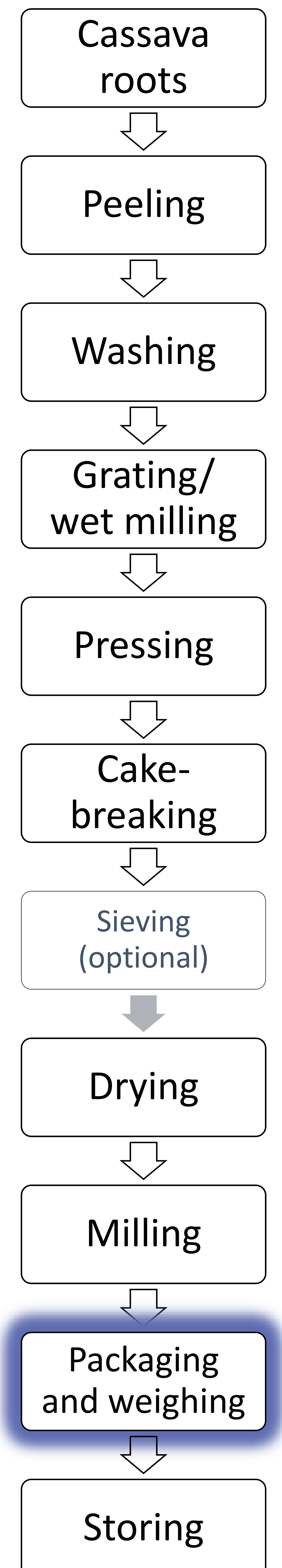
Equipment

- Bags or other packaging
- Stitching machine (optional) or manual stitching method

Tips

- Ensure product is checked regularly
- For High Quality Cassava Flour (HQCF), use polyethylene **lined** bags to prevent moisture ingress into the flour
- For correct stock rotation and quality control, bags should be labelled with the processing date

Depictions



STORING

Process

- Transfer packages onto pallets
- Transfer bags/packaging to a clean, dry and well-ventilated store until marketing

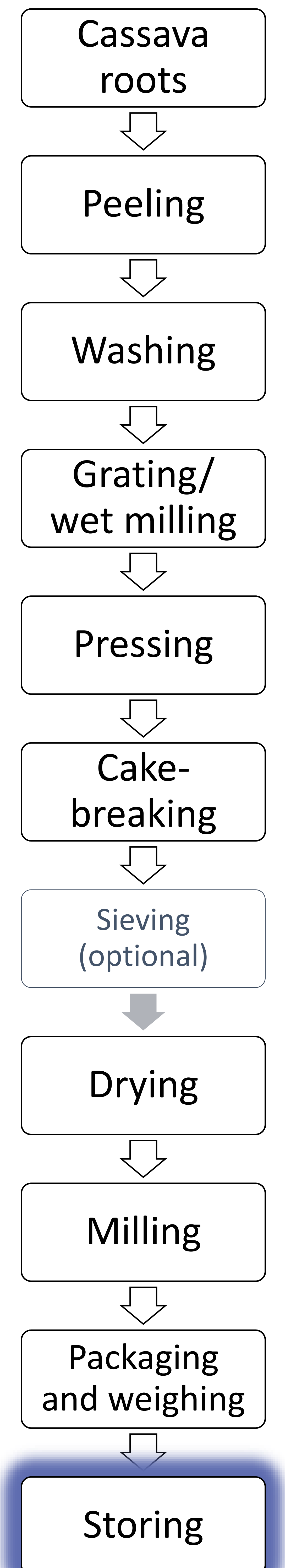
Equipment

- Pallets
- Store room

Tips

- Ensure product is checked regularly
- Store bags off the ground using pallets
- Keep perimeter around the bags accessible for inspection
- Follow 'First in, First out' rule

Depictions



Acknowledgements

The Natural Resources Institute, University of Greenwich, UK are grateful for funds from the 'Increasing the Performance of the Cassava Industry in WCA (IPCI)' and 'Cassava Adding Value for Africa (CAVA)' projects in developing these manuals. The authors acknowledge the contribution of partners, in particular, the Federal University of Agriculture (FUNAAB), Nigeria.



Natural Resources Institute
University of Greenwich
Medway Campus
Central Avenue
Chatham Maritime
ME4 4TB, UK

**CHANG
E
STARTS
HERE**