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African Smallholder Beekeeping

*Essential*

# *Honeycomb Processing*

by Kibebew Wakjira (Ethiopia)  
and Dr Guy Stubbs (South Africa)



African Smallholder Beekeeper  
*Essential Honeycomb Processing*

By  
Kibebew Wakjira (Ethiopia), and  
Dr Guy Stubbs (South Africa)

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[www.africanhoneybee.co.za](http://www.africanhoneybee.co.za)

105 Robyn Road, Lyttleton Manor, 0157, South Africa

Typesetting and technical drawings by: Bianca Keenan-Smith

Illustrations: Claire Keenan-Smith

Project Management: Dr Guy Stubbs

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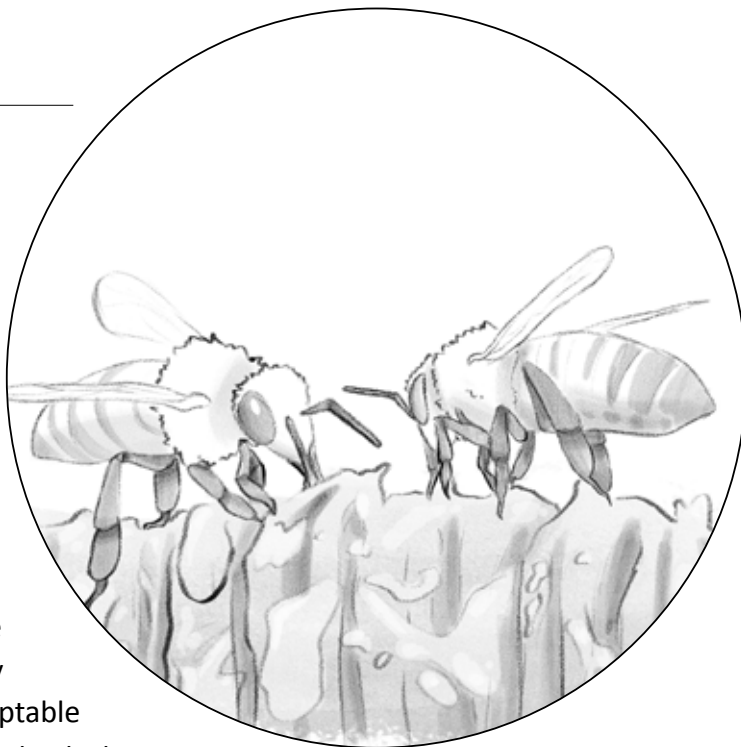
# Introduction

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Dear Fellow Beekeeper

This is an uncomplicated guide for essential processing of honeycomb from the African honeybee.

The suggestions in these manuals have been developed from research done by the Holeta Bee Research Centre, the SAMS project and African Honey Bee. We have tried to offer acceptable solutions that will enable anyone to start beekeeping using the resources available to them.



By keeping bees you are much more than a Beekeeper. You are a honeybee guardian, preserving honeybees in a sustainable way to ensure biodiversity.

Biodiversity is the natural balance in nature that enables nature to survive and sustain us. Honeybees are very important in ensuring this balance because they pollinate plants. In other words honeybees by taking pollen from one plant to another on a mass scale ensures genetic diversity of plants that strengthens environmental resilience.

By keeping bees and caring for them you are protecting them and practicing nature conservation for generations to come. So, well done.

We hope that you benefit from these manuals.

Good beekeeping

  
Kibebew

and

  
Guy  




# Advantages of modern frame hives in Africa

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- The comb is fixed firmly to the four sides of the frame.
  - This facilitates easy harvesting, and the beekeeper has less fear of damaging the comb.
- The strength of the built-in comb also allows easy transportation, even over bad roads.
  - It also affords easy control of a colony of bees without fear of breakage before the arrival at the new destination.
- Honey is extracted from modern hives by means of the centrifugal honey extractor, which makes it possible to remove the honey without damaging the comb.
  - Empty combs are returned to the hive for the bees to refill with new honey, thus saving them from wasting time and energy to construct a replacement comb.
  - The honey harvest is maximised, as the beekeeper can keep adding drawn out combs to obtain much higher honey crops.
  - In Zambia, for instance, a modern frame hive with a strong colony of bees and good management, may produce over 60 kg of honey in a year.
- During hive manipulations, very few bees are crushed between frames, in contrast dozens of bees can easily be killed with traditional hive beekeeping.
- The hive is so designed (with queen excluder and supers) that the queen and brood can be confined to the lower chamber.
  - Supers can contain only honey, and the lower brood chamber can be undisturbed when honey is harvested.
- A swarm of bees can be trapped in a modern frame hive as easily as with a traditional hive.
  - The important thing for trapping bees is the smell and cavity space, not the shape of a hive.
- Modern frame hive boxes can be stacked easily.
  - This makes it easy to expand and contract the hive to meet the needs of the bee colony.

**Note:** Bees consume the honey which causes the special wax-producing glands to convert the sugar into wax which is extruded through small pores. It takes 2.7 kg – 3.6 kg of consumed honey to produce 450 grams of wax. Wax appear as small flakes on the bee's abdomen. ***Bee producing wax***



# Important considerations

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With honey and wax processing two main things need to be considered at all times:

## 1. Food safety:

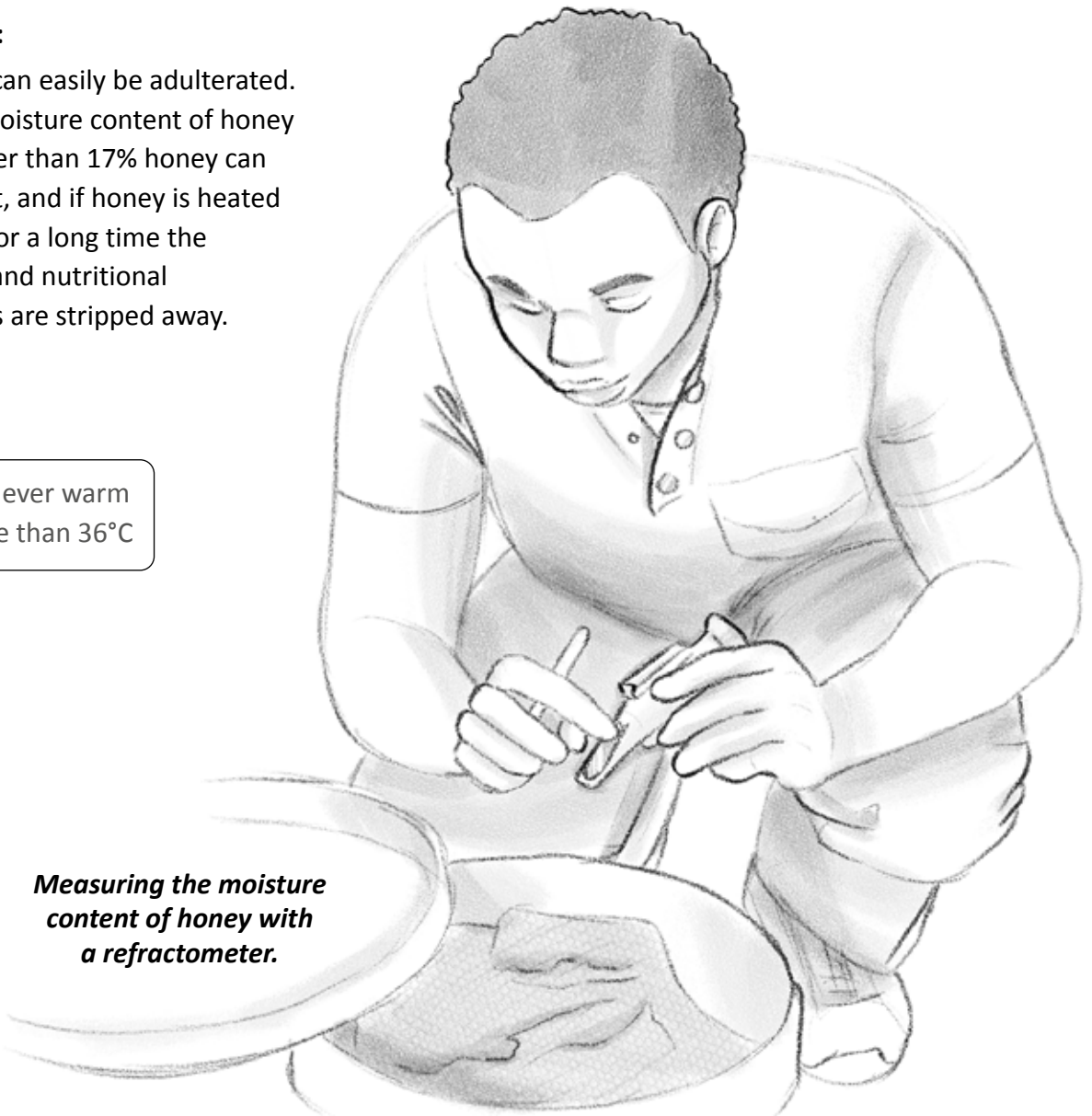
Honey is a food and therefore every precaution needs to be taken to make sure that the people who eat it remains safe.



## 2. Quality:

Honey can easily be adulterated. If the moisture content of honey is greater than 17% honey can ferment, and if honey is heated or left for a long time the health and nutritional benefits are stripped away.

**Warning:** Never warm honey more than 36°C



*Measuring the moisture content of honey with a refractometer.*

# Honey harvesting – Traditional hive

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1. Book out a food grade bucket and lid from the honey processing centre.
2. Take the bucket with your honey bag to the hive you are to harvest from.

**Note:** Make sure the bucket is free of any dust or dirt on the inside.

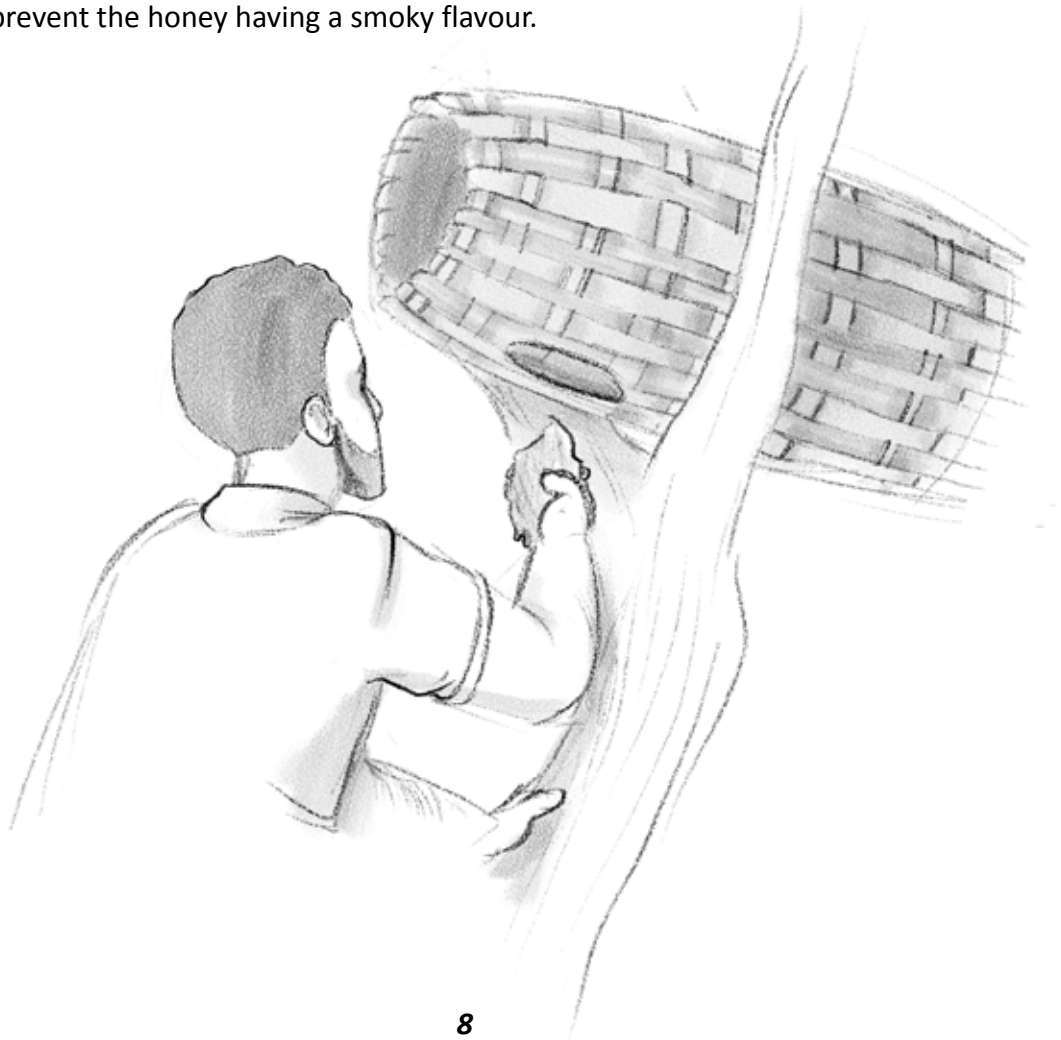


*Food grade bucket*



*Traditional honey bag*

3. When you harvest the honey don't use too much smoke. This is to prevent the honey having a smoky flavour.

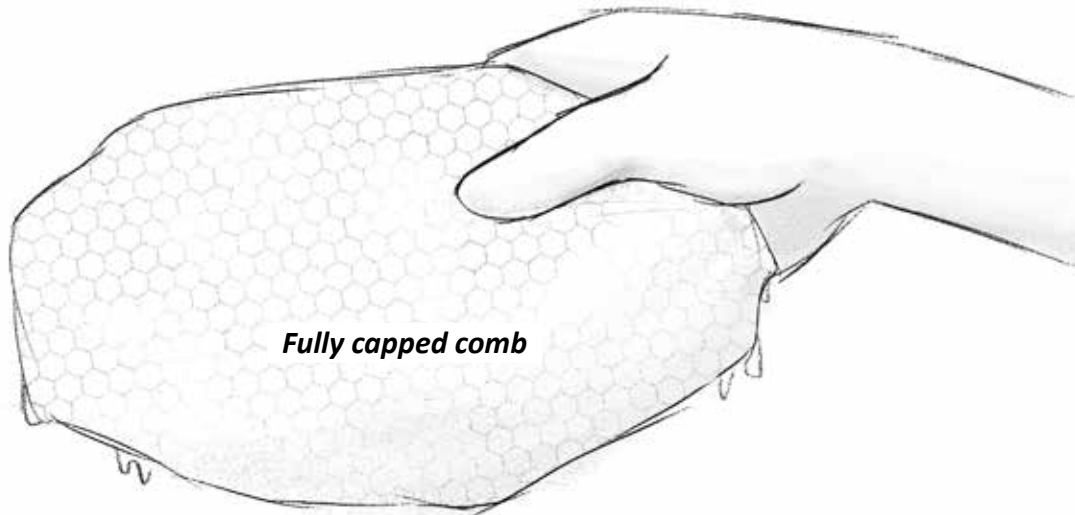




4. Separate the comb that is white and 90% capped from the rest.

i.e. honey that is free from:

- i. Eggs or brood or baby bees or adult bees.
- ii. Free from old black comb.
- iii. Free from pollen.
- iv. Free from dirt.



5. Place the white and 90% capped honey / comb into the booked out food grade bucket.

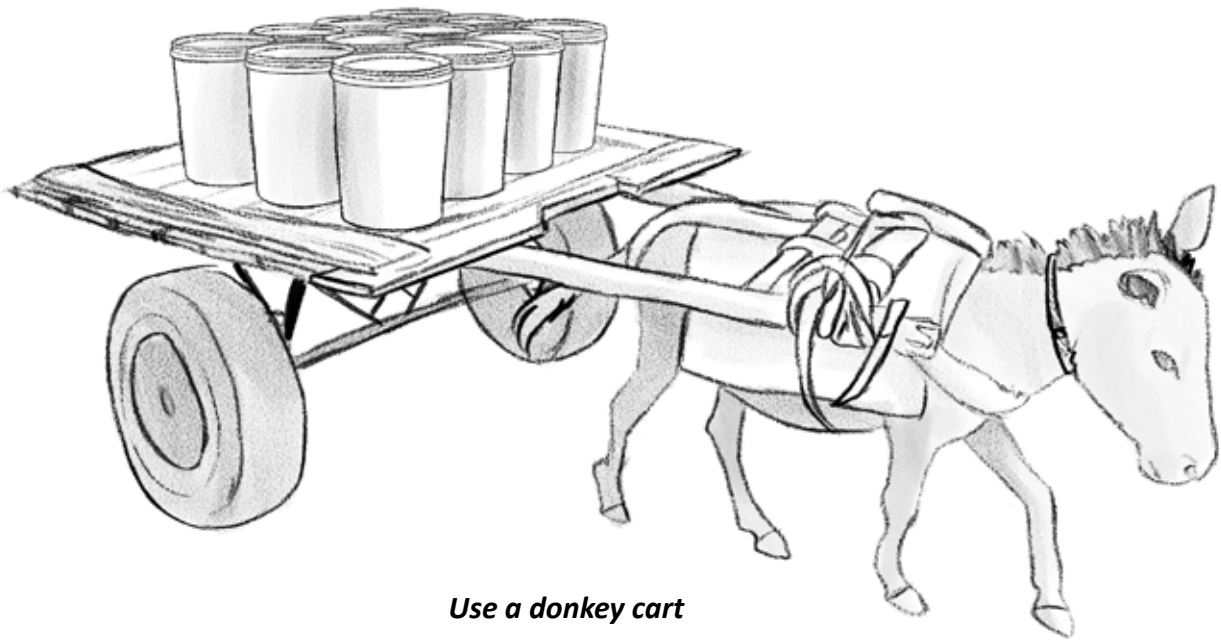
When you have finished harvesting, seal the bucket and write:

- 1) Your name.
- 2) Your mobile number.
- 3) The hive name / number that you harvested from.
- 4) The date that you harvested the honey.

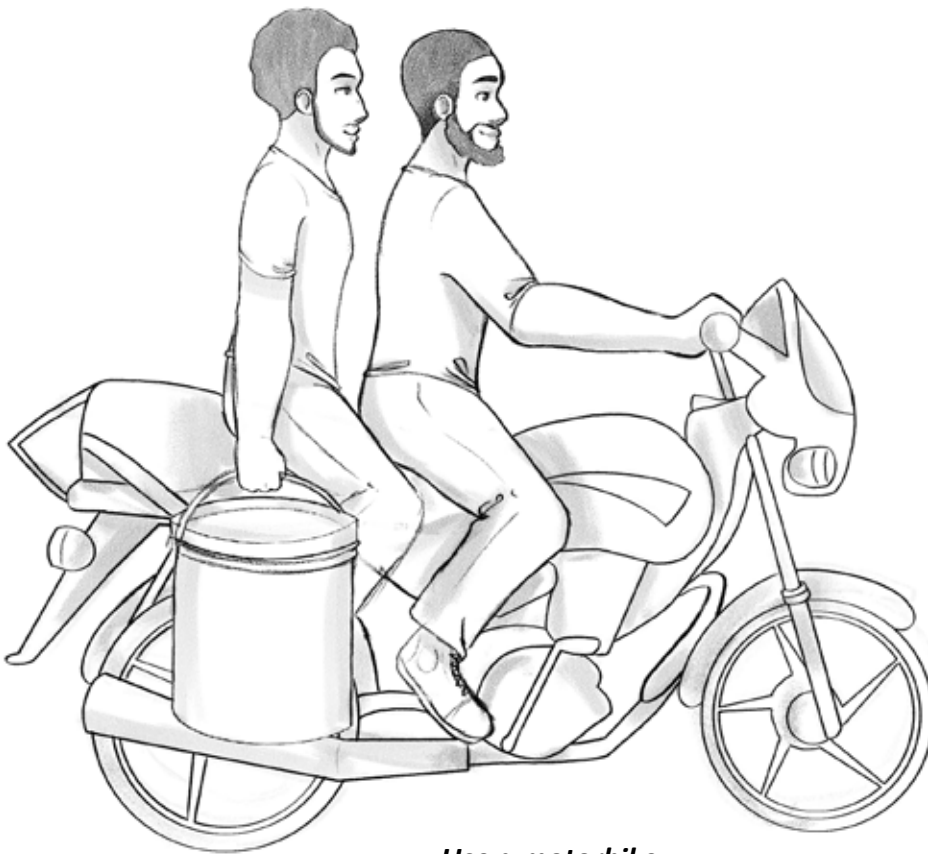
6. All the rest of the harvest can be put into any container you like, but it is recommended that you use a clean container free of contaminants.

**Note:** Do not put the clean honey in another bucket / bag / container. The honey / comb should go straight from the hive into the booked out food grade bucket.

7. Transport the booked out food grade bucket with your honey in to the processing centre.



*Use a donkey cart*



*Use a motorbike*



*Carry the bucket*

8. When you get to the centre, they must:
- a. Weigh the bucket.
  - b. Test the moisture content using a refractor meter.
  - c. Taste the honey.
  - d. Check for any contaminants such as:
    - i. Water / moisture.
    - ii. Eggs / larvae / bees.
    - iii. Black comb.
    - iv. Pollen.
    - v. Funny smells / tastes.

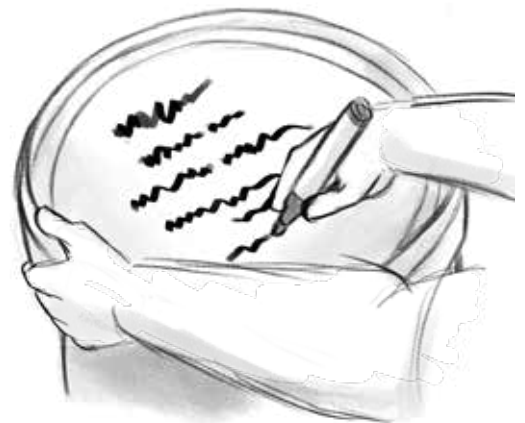


**Testing moisture**



**Weighing honey**

9. Any honey with contaminants must be rejected.
10. Honey that is accepted must be taken and
- 1) A receipt given to the beekeeper, and
  - 2) The details about the honey must be written on the bucket.
11. The following details must be written on the buckets:
- a. The date of harvesting.
  - b. The name of the beekeeper.
  - c. The contact details of the beekeeper.
  - d. The weight of the honey / comb.
  - e. The moisture content of the honey.
  - f. The name of the hive that the honey came from.



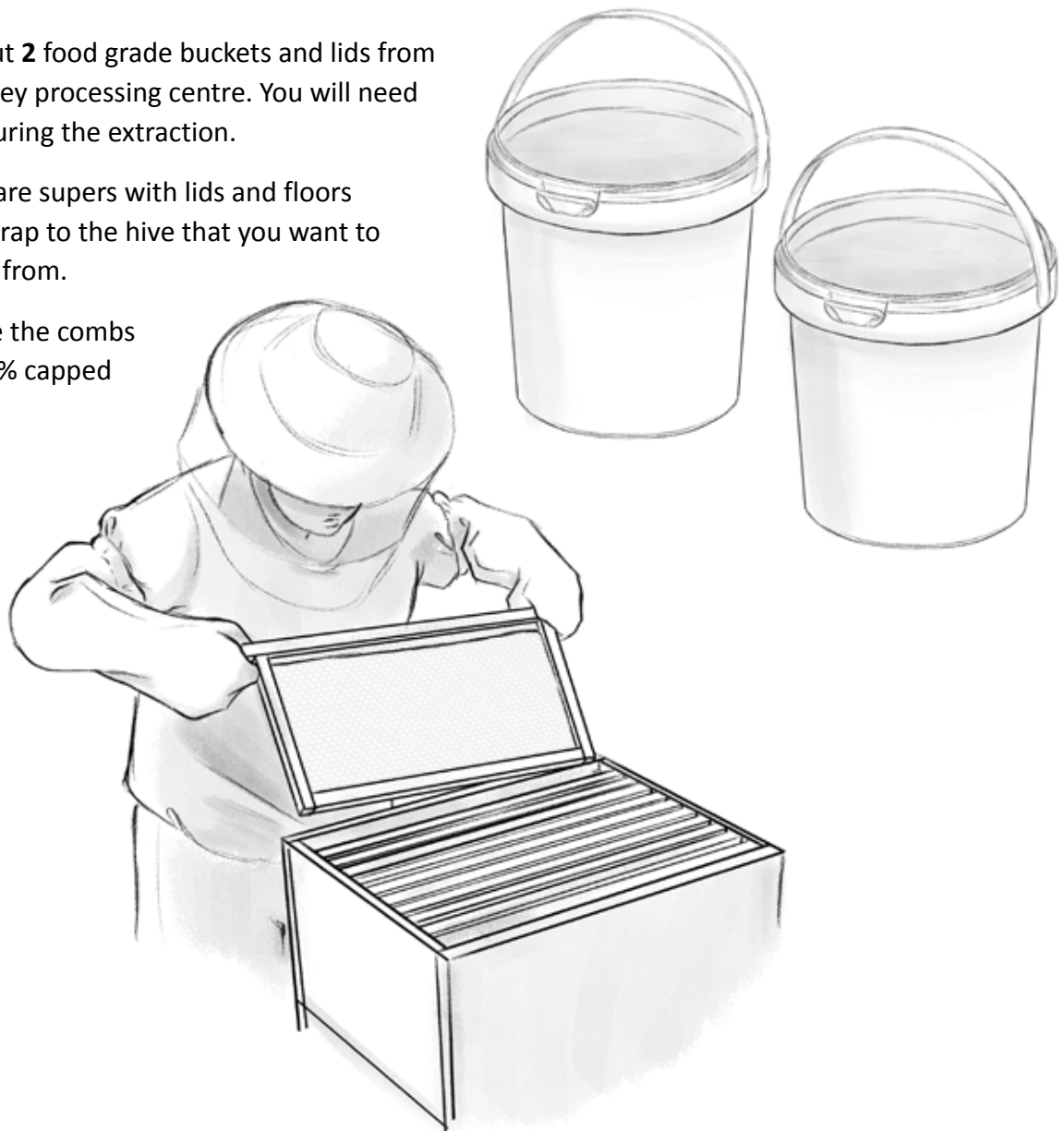
**Writing on the bucket**

12. The beekeeper needs to be paid according to the rules of the processing centre.

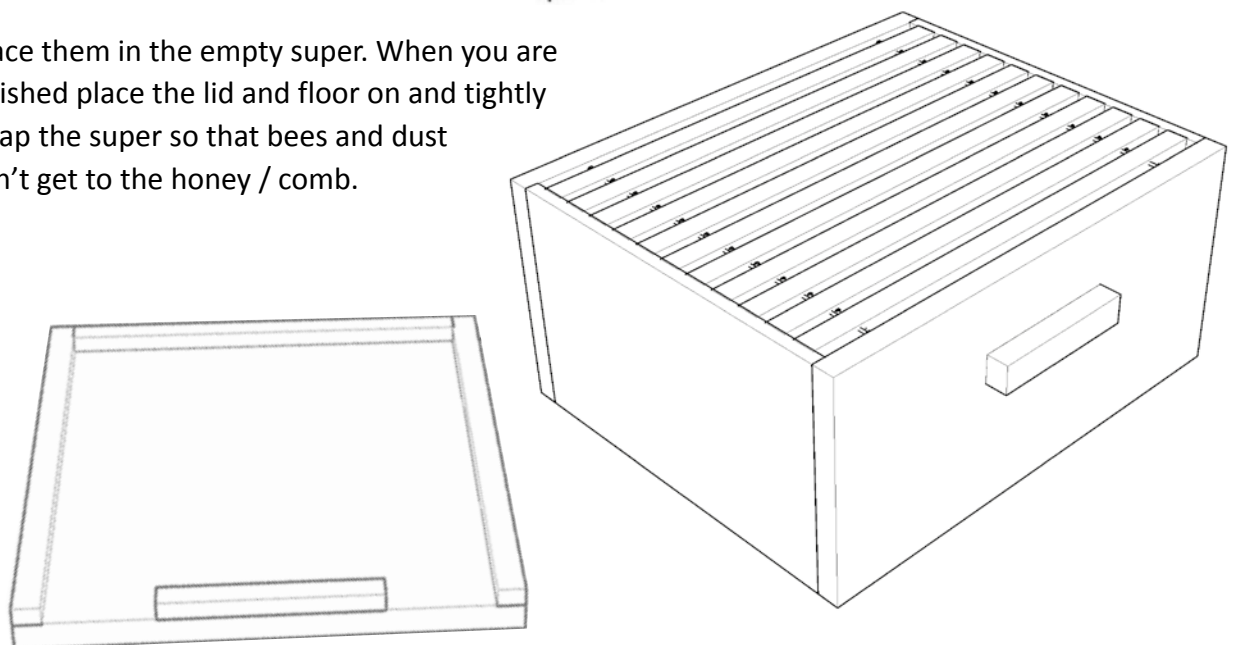
# Honey harvesting – Modern hive

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1. Book out **2** food grade buckets and lids from the honey processing centre. You will need them during the extraction.
2. Take spare supers with lids and floors and a strap to the hive that you want to harvest from.
3. Remove the combs with 90% capped honey.



4. Place them in the empty super. When you are finished place the lid and floor on and tightly strap the super so that bees and dust can't get to the honey / comb.



5. Transport the super with the harvest to where the extractor is.

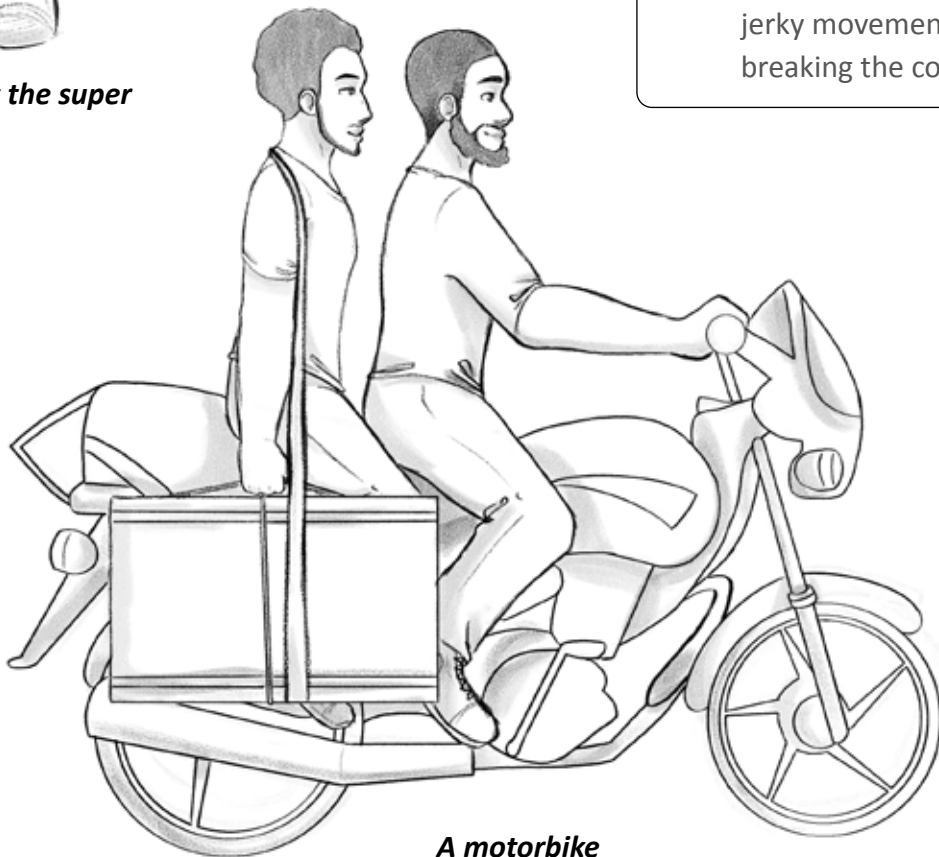


*Carry the super*



*Use a donkey*

**Note:** Be very gentle with the harvested comb – no jerky movements to avoid breaking the comb.



*A motorbike*

6. When you get to the extractor, make sure that your two booked out food grade buckets are there.

7. Uncap your combs and place the capping into the first booked out food grade bucket.



*Uncapping into a bucket*

8. When the combs have been uncapped, place them in the extractor and spin the extractor first clockwise and then anti-clockwise until all the honey is out of the combs.



**Tip:** Extract your honey as soon after harvesting as possible while it is still warm. If you need to store the honey before extracting, store it in a warm room so that the honey stays warm.

**Note:** Be very careful not to break the drawn out comb.



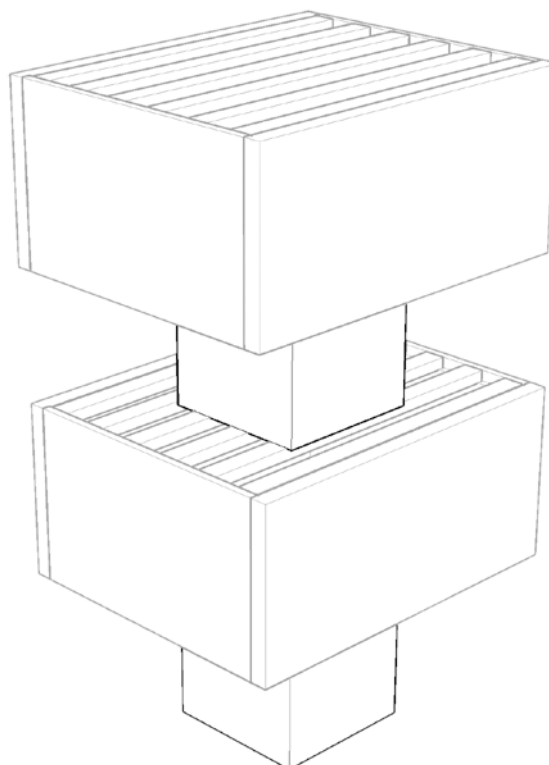
9. When finished extracting all your combs from one hive, tap the honey out of the extractor tank into the second booked out bucket.

**Tip:** Extract your honey in a clean dark room free of bees.

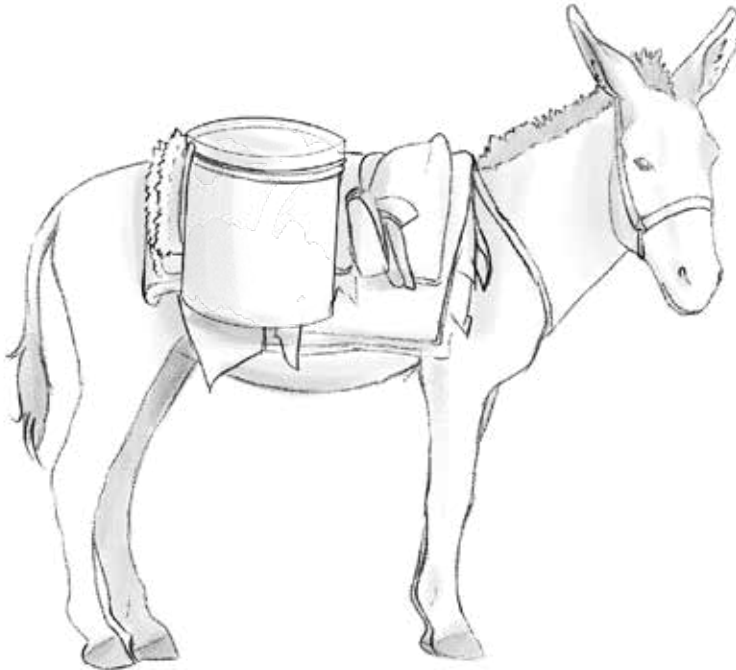


**Note:** Bees keep the inside of their hive at 36°C.

10. Put your extracted frames of drawn out comb out for bees to clean them, or even better back onto the hive that you harvested them from.
11. When you frames of drawn out comb are dry, stack them with lots of light and air (so wax moths don't destroy them) until the next flow when you can add them to the hive again.



**12.** Transport your booked out food grade buckets (one with cappings and the other with honey) to the processing centre.



*Use a donkey*



*Carry the bucket*



*A motorbike*



**13.** When you get to the centre they must:

- a. Weigh the buckets.
- b. Test the moisture content using a refractor meter.
- c. Taste the honey.
- d. Check for any contaminants such as:
  - i. Water / moisture
  - ii. Eggs / larvae / bees
  - iii. Black comb
  - iv. Pollen
  - v. Funny smells / tastes



**Weighing honey**



**Testing moisture**

**14.** Any honey with contaminants must be rejected.

**15.** The bucket with the wax cappings must be given in as well.

**16.** Honey that is accepted must be taken and

- 1) A receipt given to the beekeeper, and
- 2) The details about the honey must be written on the bucket.

**17.** The following details must be written on the buckets:

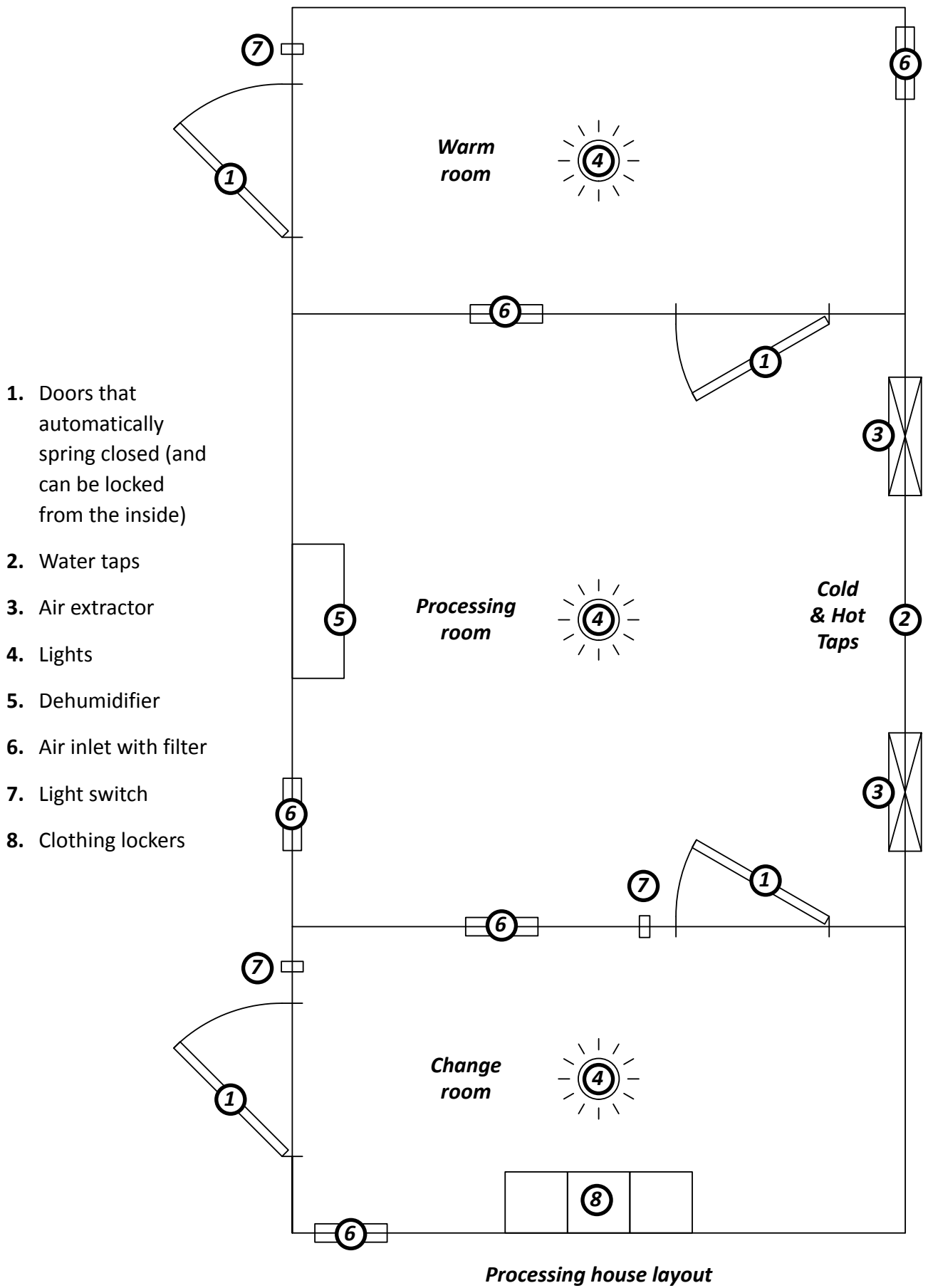
- a. The date of harvesting
- b. The name of the beekeeper
- c. The contact details of the beekeeper
- d. The weight of the honey / comb
- e. The moisture content of the honey
- f. The name of the hive that the honey came from

**18.** The beekeeper needs to be paid according to the rules of the processing centre.



**Writing on the bucket**

# The honey processing centre



Processing house layout

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The honey processing centre needs to have three rooms with two outside doors and two inside doors between rooms.

The rooms need to consist of:

**1. The warm room**

This room needs to be kept as close to 36°C as possible when processing honey. It is the room where honey / comb is warmed up to hive temperature before processing and where honey is left to strain after processing.

**2. The processing room** needs to have some basic processing equipment and access to water. It also needs to be sealed off from the outside so that exposed honey is least contaminated.

**3. The change room** is where operators prepare themselves to be as hygienic as possible before entering the processing room.

If the honey processing centre is run according to HASSP guidelines, it can achieve HASSP accreditation.

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## Basic considerations

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- a. The width of the warm room walls need to be able to insulate temperature.
- b. The honey processing centre needs to be clean so drains should be available for dirty water to flow out.
- c. The honey processing room needs a water point both for cleaning as well as washing wax.
- d. The water should be good enough for human consumption.
- e. Warm water is ideal.
- f. The warm room should be kept at 36°C when being used.

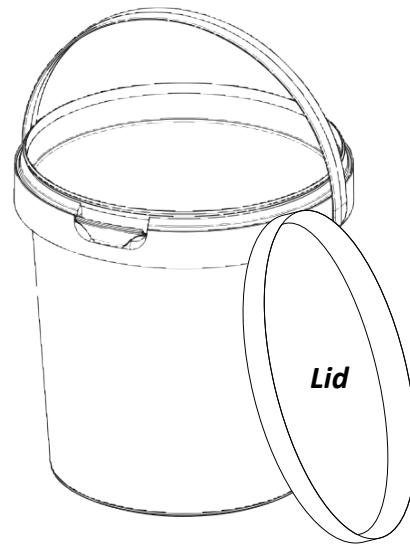
**Tip:** If you don't have electricity think of how you would keep a room warm in winter and then replicate that method.

## Equipment needed

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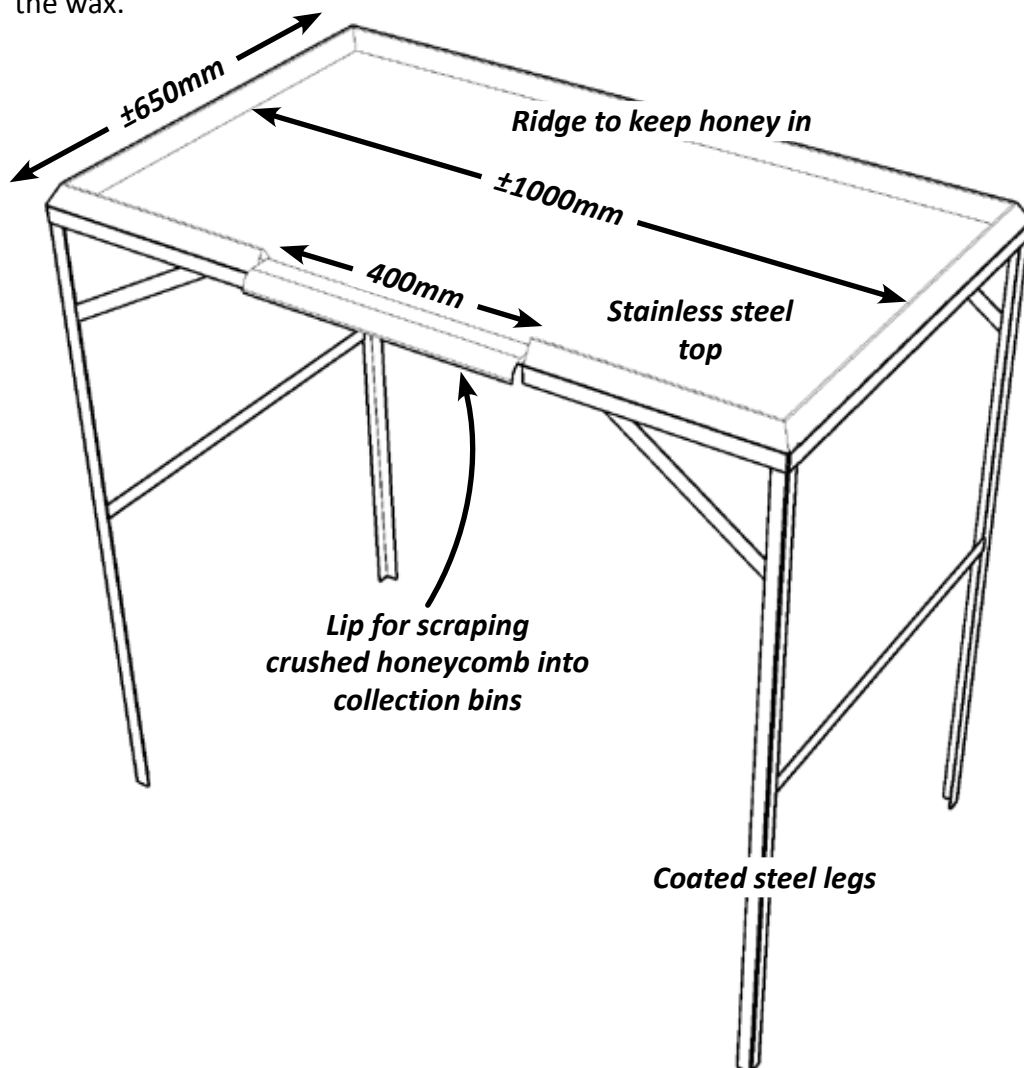
### 1. Food grade buckets

Food grade 20 / 25 Litre buckets with sealable lids are the most useful equipment because you can transport raw harvested honey / processed honey / beeswax / honey water in them.



### 2. Stainless steel cutting tray

This tray is used to pour honey / wax on and chop it up to enable the honey to separate from the wax.



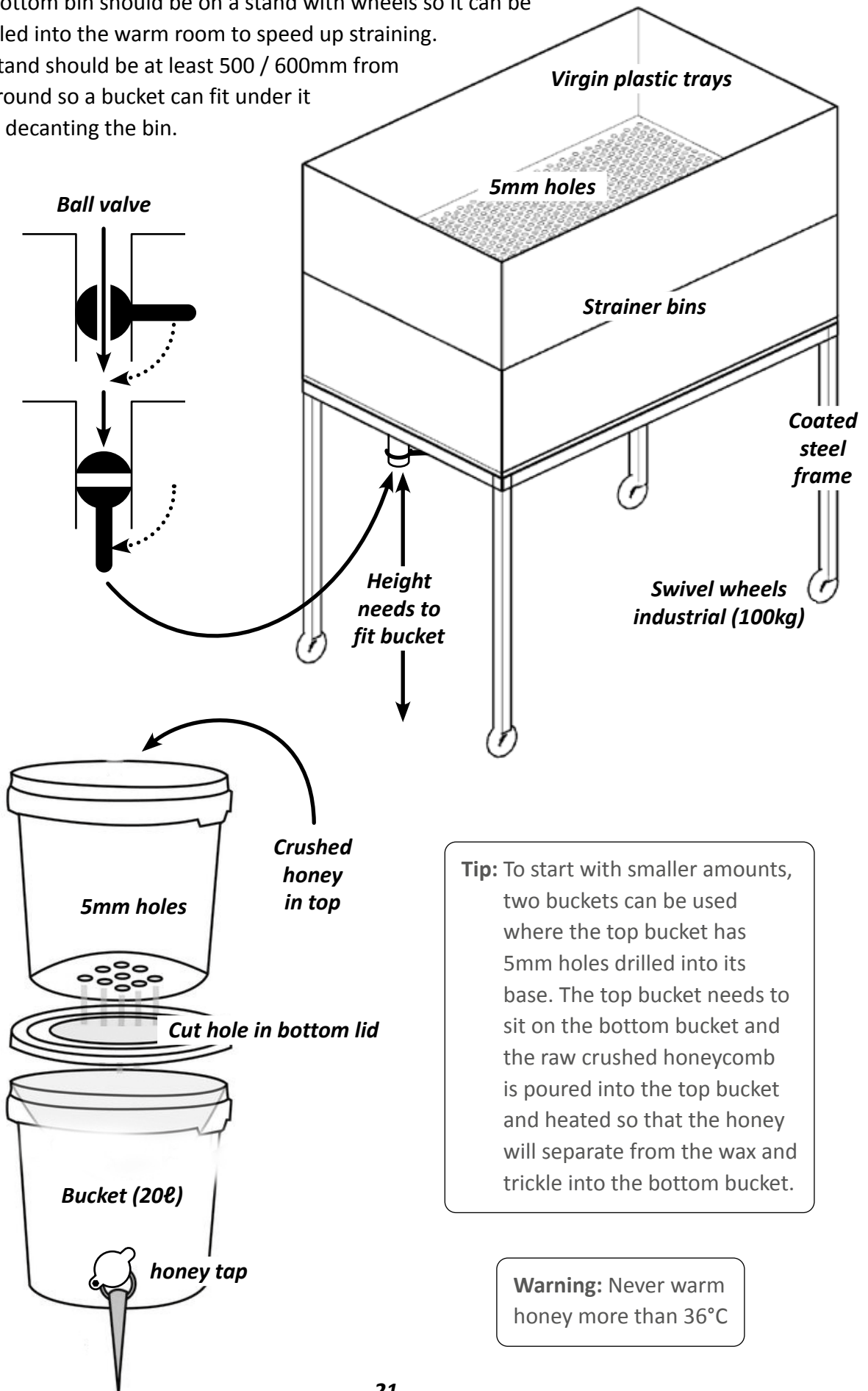
### 3. Strainer bins

These are plastic bins with 5mm holes in the top one to strain honey.

The bottom bin should be on a stand with wheels so it can be wheeled into the warm room to speed up straining.

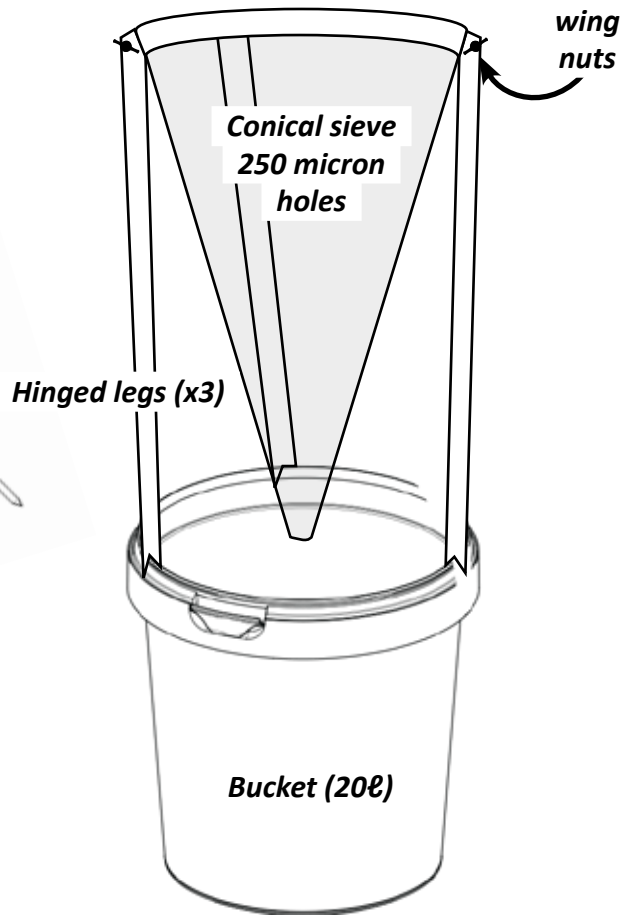
The stand should be at least 500 / 600mm from the ground so a bucket can fit under it

when decanting the bin.

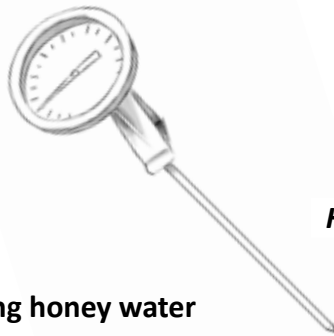


**4. Conical nylon sieve**

This is a nylon sieve that fits onto a stand that sits on top of a bucket.

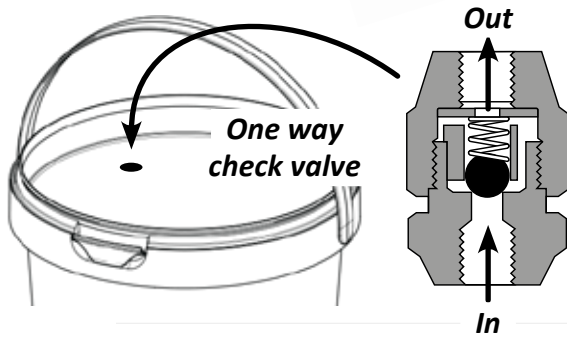


**5. Honey thermometer**



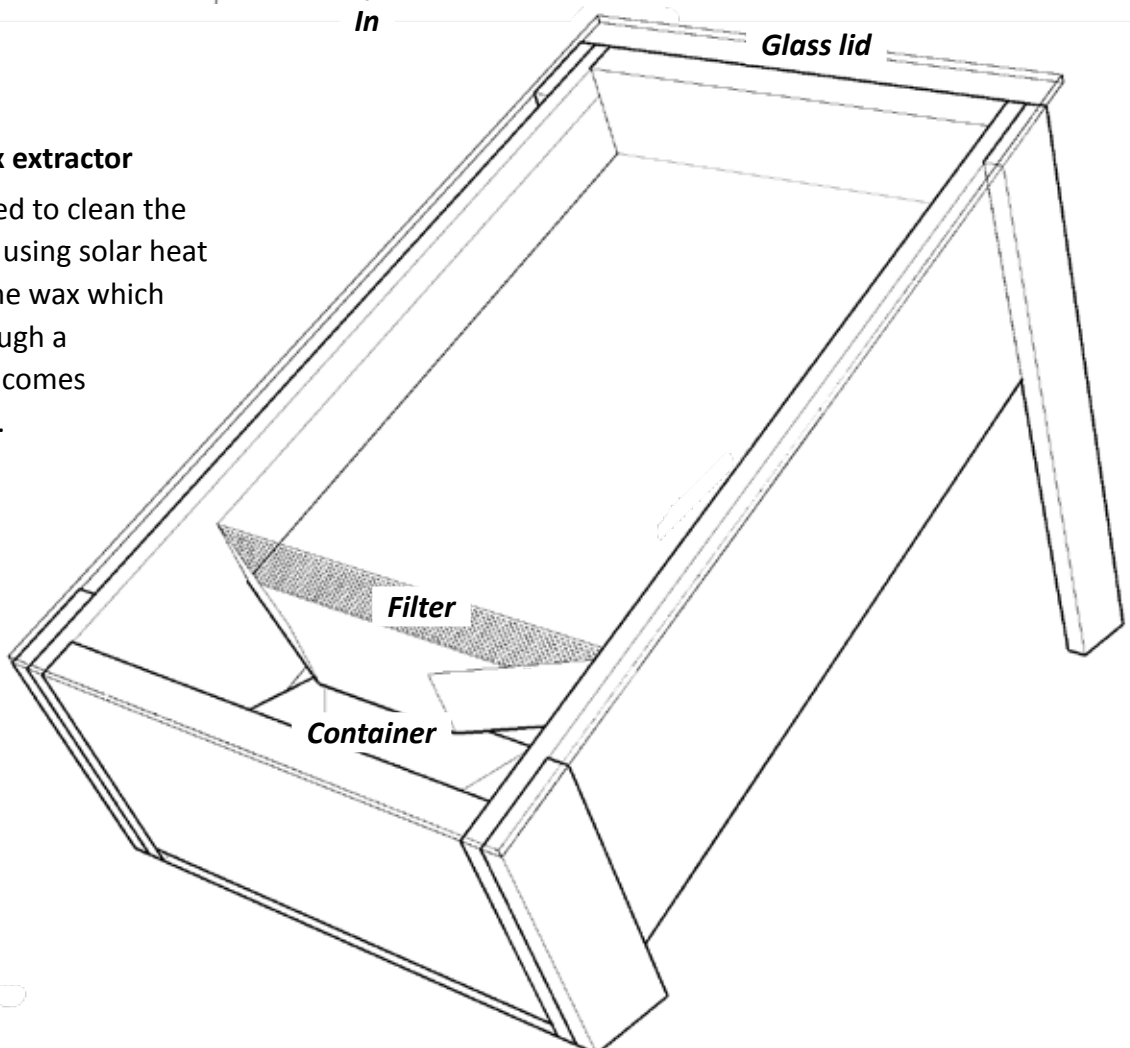
**6. Bucket for transporting honey water**

This is simply one of the food grade buckets with a non-return valve screwed in the top.

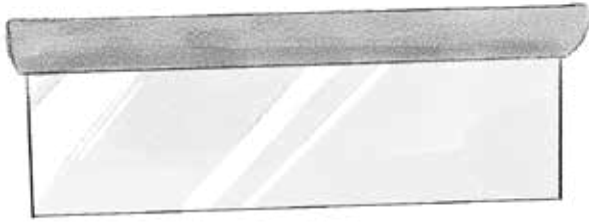


**7. Solar wax extractor**

This is used to clean the honey by using solar heat to melt the wax which runs through a filter and comes out clean.



**8. Stainless steel knife**



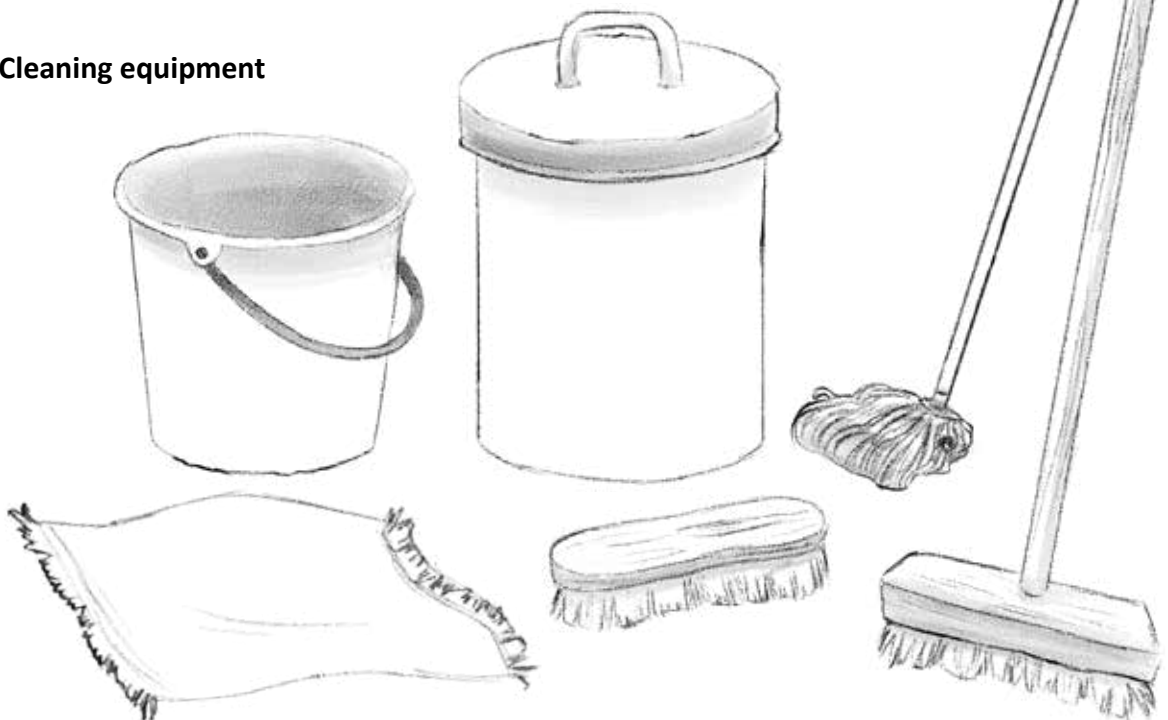
**9. Silicon spatula**



**10. Food safety clothes**



**11. Cleaning equipment**



# The process

## Phase One – Separating wax and honey

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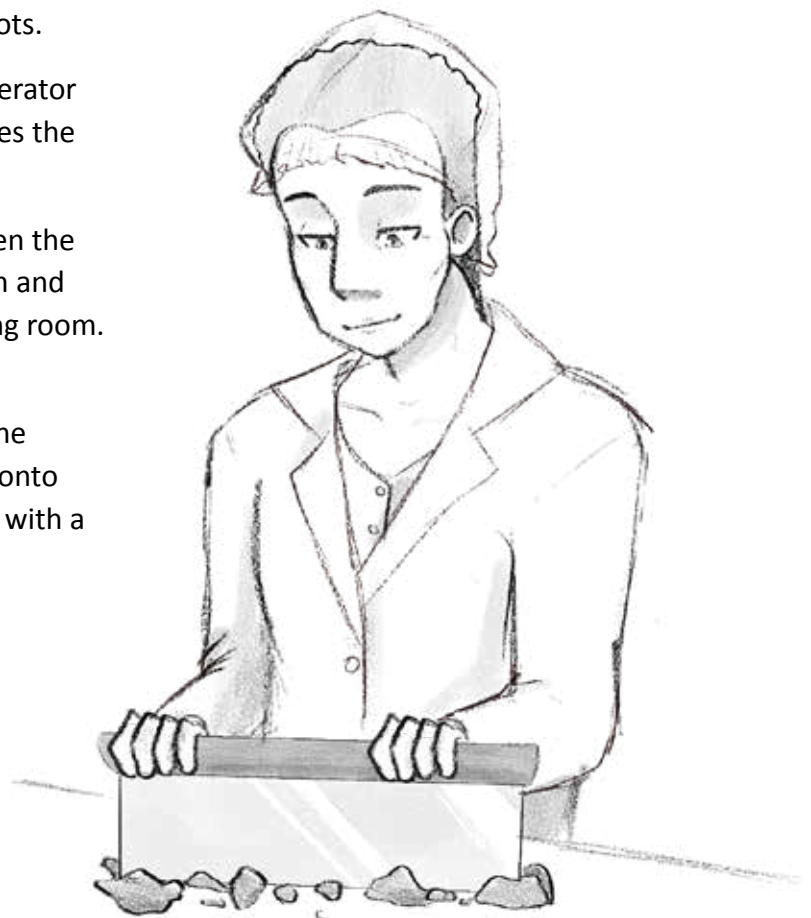
1. Raw honey, extracted honey and cappings arrive at the centre in booked out food grade buckets.
2. The content is inspected and recorded.
3. A receipt is given to the beekeeper to claim payment.
4. All the beekeeper's details are recorded on the lid of the bucket.
5. The buckets are placed in the warm room.
6. The honey / wax is left in the warm room for 24 hours.

**Warning:** Never warm honey more than 36°C.

**Tip:** If the buckets are placed on stands that allow air to move under the buckets the honey will reach temperature quicker.

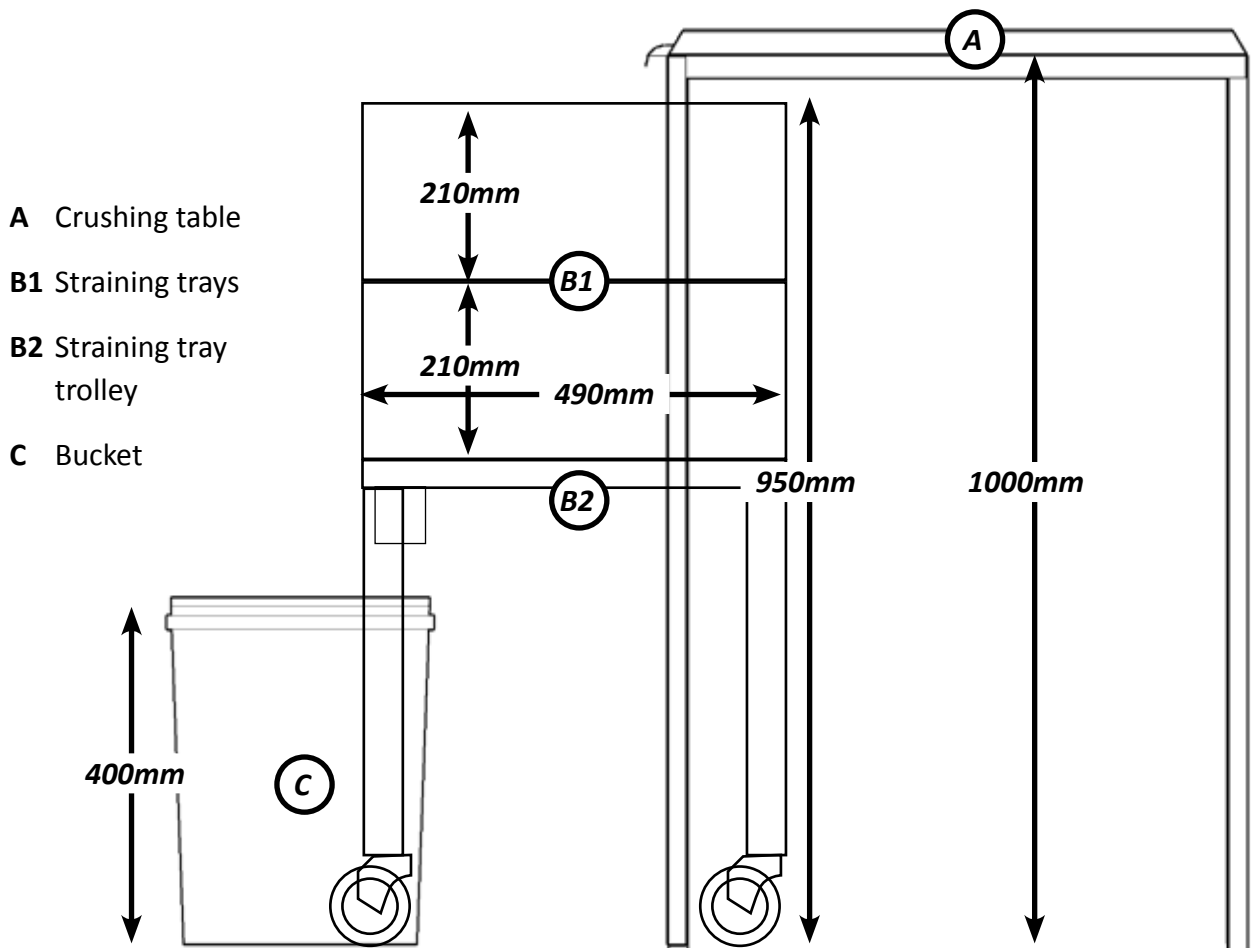
7. The operator enters the change room and changes into clean:
  - a. Lab coat
  - b. White gum boots
  - c. Hair netAnd sanitizes his / her hands and boots.

8. With the outside door closed the operator enters the processing room and closes the door behind him / her.
9. The operator opens the door between the processing room and the warm room and brings the buckets into the processing room.
10. The honey / comb from traditional beekeepers and the cappings from the modern hives beekeepers is poured onto the stainless steel table and crushed with a stainless steel knife.





11. This honey / wax mix is then poured into a plastic strainer bin. The bin is then wheeled into the warmer room until most of the honey is in the bottom bin and wax in the top one.

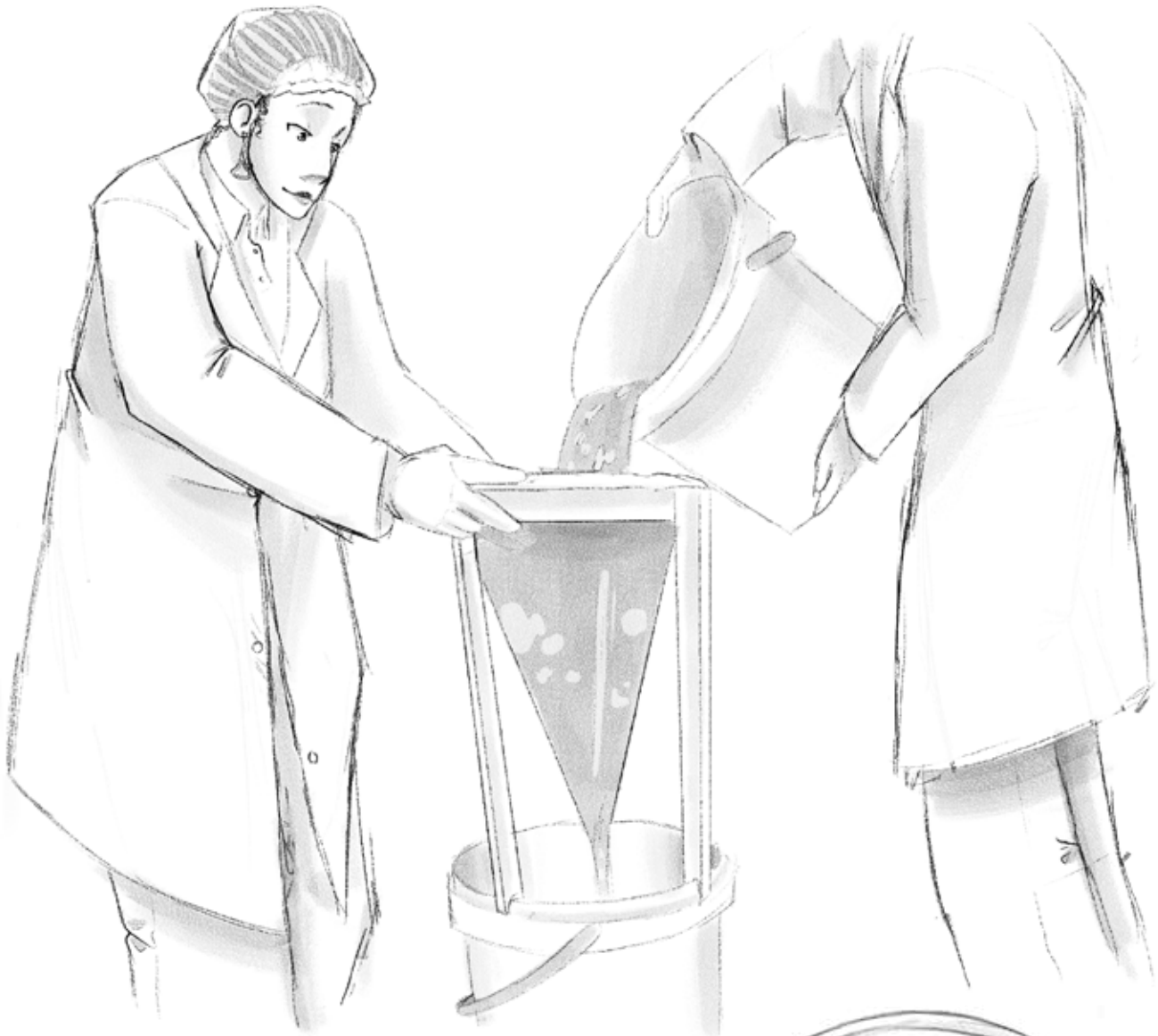


*Ideal heights to be considered*

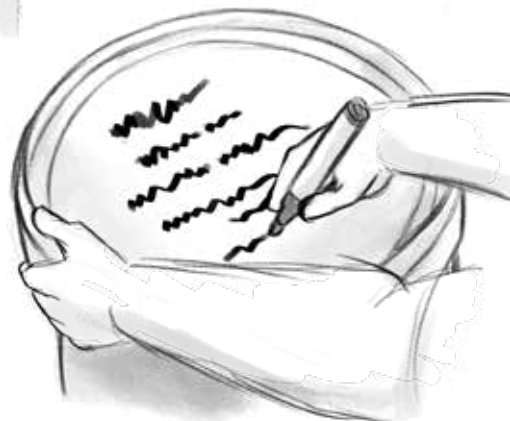
## Phase Two – Cleaning the honey

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1. All the honey collected in the straining bins as well as the honey that was extracted should be in buckets.
2. This honey is poured through the conical sieves to clean the honey even more.



3. This cleaned honey is then sealed in the buckets and all its details are written on the lid with a permanent marker.

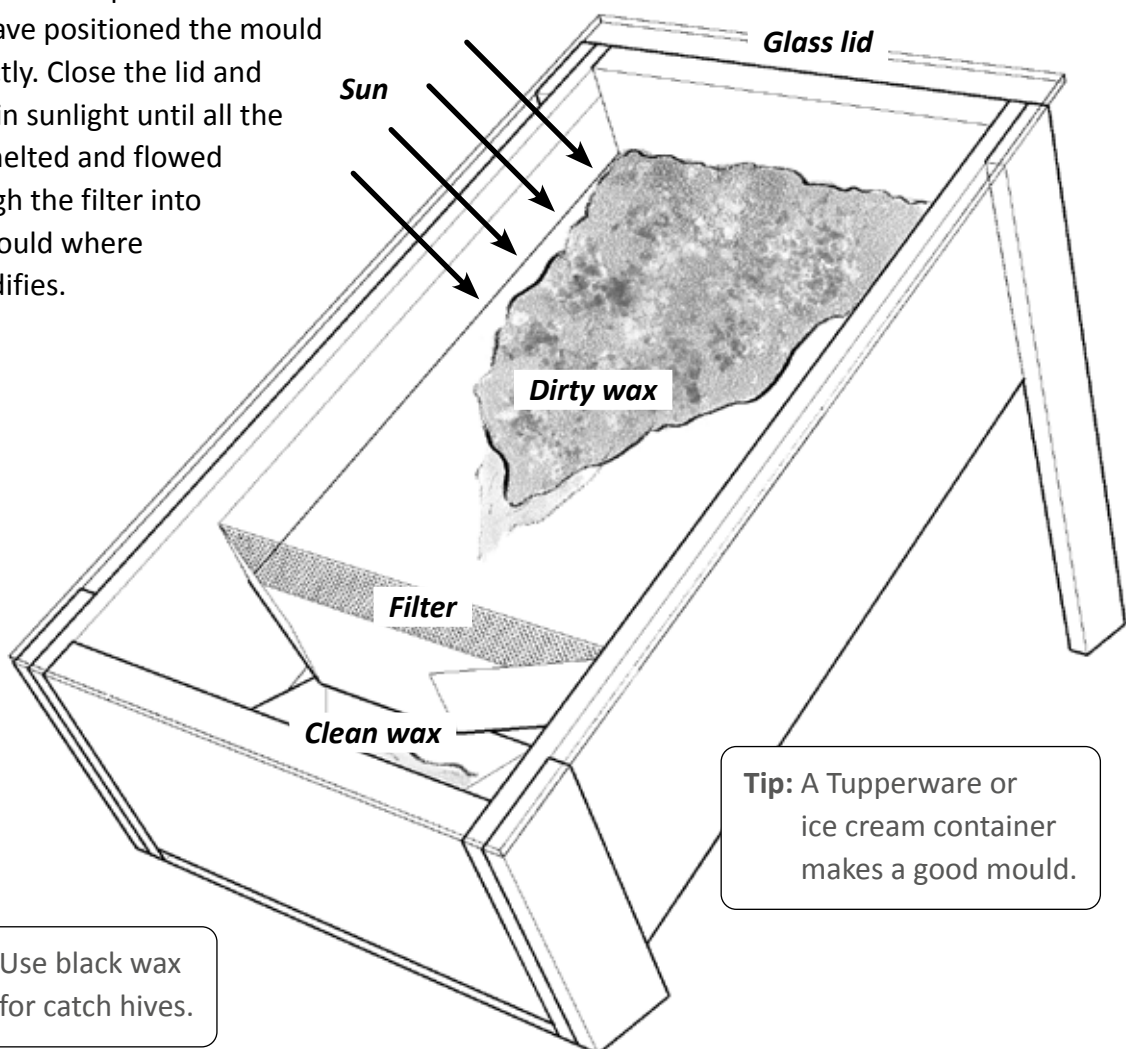


*Writing on the bucket*

## Phase Three – Wax and honey water

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1. The wax left over is poured into buckets that are filled with clean water.
2. The wax / water mix is stirred with a ladle until the wax is less sticky.
3. The wax / water mix is then poured through the conical sieve.
4. This process is repeated until the wax is no longer sticky.
5. The honey water is then poured into a bucket with a one way check valve in the lid and transported to the honey water processing plant.
6. The wax is then taken to the solar wax extractor.
7. The dirty wax is placed in the solar wax extractor trough. Check that the filter is clean and in place. Check that you have positioned the mould correctly. Close the lid and leave in sunlight until all the wax melted and flowed through the filter into the mould where it solidifies.



# Washing the honey processing centre and equipment

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It is easy to wash honey off because it is soluble in water.

## 1. Floors and wall

Pour warm water on the floor and wall and rub with a broom and mop.

**Note:** Ensure that everything is 100% dry before adding honey otherwise the honey will be adulterated.

## 2. Cleaning equipment

Wipe down equipment with warm water and a wet cloth, rinse and drip dry.

**Tip:** Use food grade mops, cloths and brooms to reduce contamination and make the honey safer for eating.

## Endnote

---

As you will have seen in this manual, we have offered some practical and accessible solutions for essential honeycomb processing. These methods have been trialed and tested in both countries.

The method used for problem solving is known as Asset Based Community Development (ABCD). ABCD is a methodology for the sustainable development of communities based on their strengths and potentials. It uses the community's own assets and resources as the basis for development; it empowers the people of the community by encouraging them to use what they already possess.

We have found the adage: "Give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime," to only be true if you first teach a man to make the equipment he needs to fish. God has given each one of us the gifts we need to change our lives. We are blessed with relationships; we have families and communities. We are blessed with assets such as natural resources, waste that we can recycle, and the things we own. We are blessed with abilities, talents, the passion to learn, and the capability to work hard. This book suggests ways that we can use these gifts to change our lives, the lives of our families and those of our communities.

There are many books about more advanced beekeeping than what is suggested in these manuals. These will make a lot more sense once you have learnt the basics taught in these manuals. Treat the lessons learnt here as a foundation that you can build on.

Good beekeeping



and



# Some check lists

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## Quality and food safety control

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When harvesting from traditional hives the following procedures should be followed:

1. At least 2 clean, dry 20 ℓ food grade buckets per hive must be booked out by a beekeeper when they go to harvest
2. All clean, capped comb with honey to be kept separate to comb with pollen, old beeswax and any comb that has got dirty
3. No comb with brood / larvae should be accepted
4. Buckets are to be sealed before being transported to the processing centre
5. Buckets are weighed and recorded when arriving at the processing centre
6. The following information must be written on each bucket: 
  - a. Date of harvest
  - b. ID number / birth date, Family name, First name, Hive number of hive being harvested
  - c. Crude honey weight
  - d. Cleaned honey weight
  - e. Cleaned beeswax weight
  - f. Cleaned beeswax moisture content
7. Harvested honey must be recorded against each hive in the following way: 
  - a. Date of harvest
  - b. ID number / birth date, Family name, First name, Hive number of hive being harvested
  - c. Crude honey weight
  - d. Cleaned honey weight
  - e. Cleaned beeswax weight
  - f. Cleaned beeswax moisture content
8. Buckets may only be opened in the controlled environment in the processing room
9. Workers must go through full HASSP steps when entering the processing centre
10. Honey can only be loaded into the warming room if the inside door (to the processing room) is closed (a lock from the inside is suggested to enforce this)
11. Temperature in the warming room must not exceed 36°C
12. Sterilised food safety clothing must be worn inside the processing centre
13. Only warm clean water (no chemicals) can be used to clean the processing house, equipment and buckets
14. Only clean, dry buckets may be used for honeycomb or honey

- 
- 15. Food safety clothes (white gumboots, white lab coat, hair net) must be washed daily
  - 16. Hands and gumboots must be sterilised before workers enter the controlled environment processing room
  - 17. **Note:** It is recommended that the off-taker conducts frequent residue monitoring (EU offers acceptable guidelines)

**Procedures for harvesting from modern hives:**

- 1. The same procedures must be followed as with traditional hives
- 2. The only difference is where capped frames are removed from the hive 
  - a. Cappings are removed with a capping fork
  - b. Honey is spun in a centrifugal extractor
  - c. Honey and cappings are stored and transported in sealed booked out 20 ℓ buckets
  - d. Spun frames are returned to the hive they came from or put out for bees to clean them, and then stored for the following season

## Equipment cleaning

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### Cleaning honey from a bucket

1. As much honey must be removed from a bucket using a silicon spatula (a metal knife can scratch the plastic)
2. Hot / warm water is used to remove all honey / beeswax
3. The bucket must be drip dried in a space with no dust

### Cleaning sieves and strainers

1. Hot / warm water must be used to clean sieves and strainers
2. They must drip dry

### Cleaning the processing house

1. All interiors need to be cleaned after each batch has been processed
2. The processing house must be clean before honey / beeswax is processed
3. Only food grade mops, brooms, cloths may be used for cleaning
4. Cleaning must be recorded i.e. date, cleaner, work done, equipment used etc. for HASSP

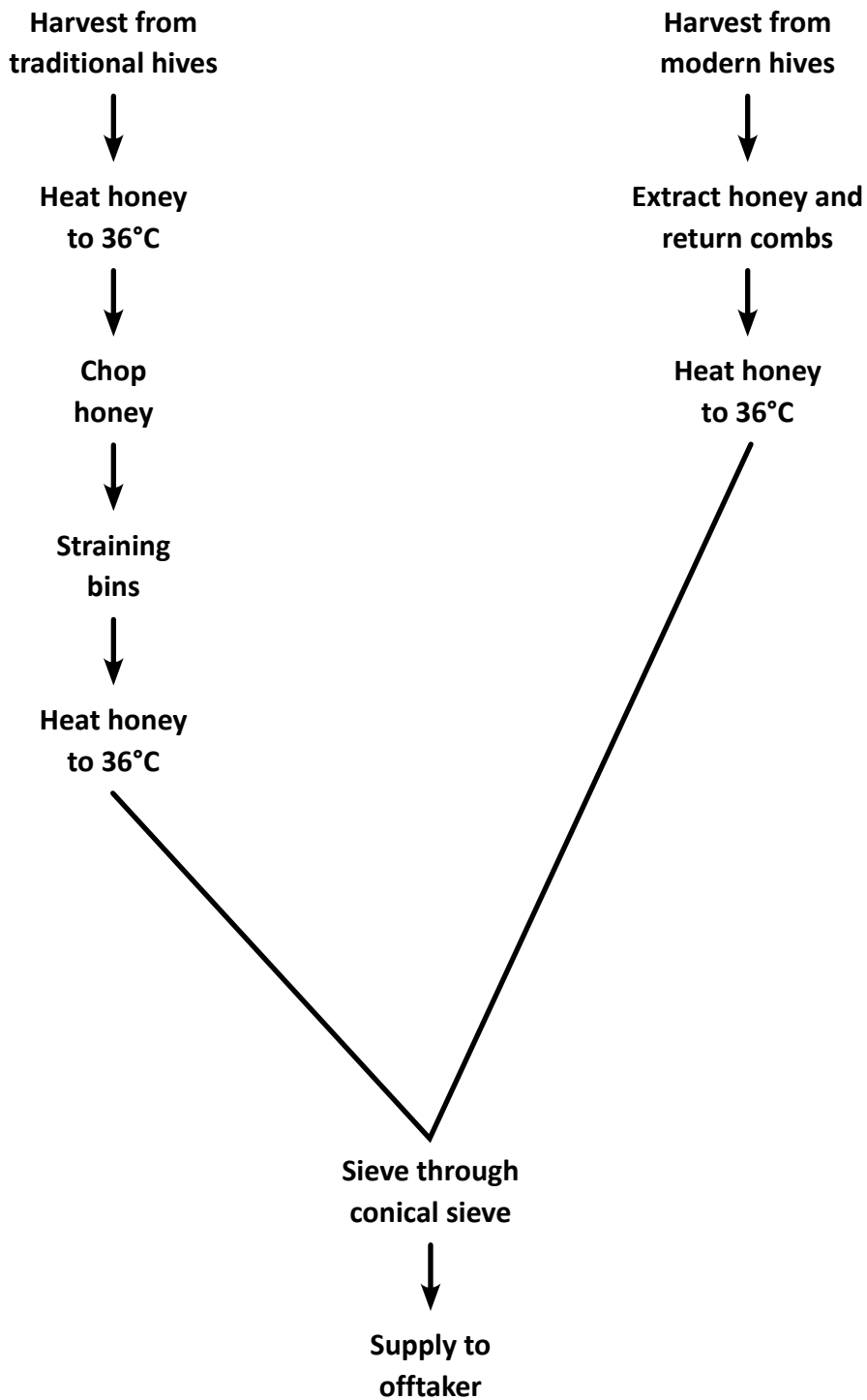
### Traceability

1. Data collection – it is critical to collect data from the beekeepers
2. Data storage – Dated Excel spreadsheets
3. Proposed initial survey questions (these should be updated every 6 months)
  - a. Member of Cooperative / Not a cooperative member
  - b. Family name
  - c. First names
  - d. ID number / birth date if ID number doesn't exist
  - e. Clear photo of face
  - f. GPS of dwelling
  - g. Numbers (starting with T1) of traditional hives and GPS locations (GPS must be taken directly below the hive and only recorded when accuracy is less than 3m)
  - h. Numbers (starting with M1) of modern hives and GPS locations (GPS must be taken directly below the hive and only recorded when accuracy is less than 3m)
  - i. The hive has bees? Yes / No  Yes  No
  - j. Processing house / collection point GPS



# Honey Processing Steps

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Developed within project **Improved livelihoods of coffee and honey/bee by-product producers within conserved landscapes in Bale, Ethiopia**

Funded by Caritas Switzerland

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