Each comb is tied on to a frame using plantain rope. Note that most of the bees are not on the frames but in the hive where it is dark.

Two brood combs (built across the frames) are tied on to separate frames and are ready to be returned to the hive.

3. Cut out the top-bar with the cross comb bearing the weight of the comb with your other hand
4. Carry the top-bars out of the hive and gently lay them flat on the hive roof which has been placed on level ground
5. Use a well prepared rope and tie each comb on to a separate top-bar
6. Arrange each of the top-bars with comb back into the hive body, cover gently and leave alone.

Expected outcome
Leave the hive alone for 1-2 weeks before you check the colony. If you have been successful, the bees will have attached the combs on to the frames or top-bars with wax and you can remove the holding ropes. The bees will now follow your pattern and build parallel combs on the remaining top-bars or frames. In the 20 colonies where we have performed this operation we have achieved 100% success.

UNDERSTANDING HACCP-HAZARD ANALYSIS CRITICAL POINT SYSTEM

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The EU has strict controls about food safety, with implications for honey exporters planning to sell into the EU market. There are many regulations and directives that apply when considering the export of honey to the EU, and almost all aim to ensure that honey is safe for human consumption¹. The possible hazards that these regulations seek to control include contamination from pesticide residues, contamination from residues of veterinary products, and other forms of contamination that might result from poor hygiene, inappropriate storage or deliberate or accidental adulteration with other substances. The names of the EU regulations and directives can be daunting, as can the length of the list (Directive 96/23/EC, Regulation 396/05, Regulation 2377/90 are just a few). This is how to approach this complex tangle of red-tape:

• do not panic
• remember that most requirements can be met with common sense
• become informed.

This article will explain about one EU requirement that concerns the processing of food products in factories, and goes by the acronym HACCP (pronounced 'HASUP'). HACCP stands for Hazard Analysis Critical Control Point and is a process rather than a single indicator of food quality. This process was developed originally by NASA in the 1970s and has since been adopted by many authorities, including the EU, who need to ensure that effective food safety processes are implemented. HACCP:

• is a process – not a single indicator of quality such as presence or absence of a chemical contaminant
• has been adopted by the EU, in recognition of the robustness of the system in assuring food safety

is regulated by EC Regulation 852/2004, which requires that all businesses that handle food destined for the EU, implement a HACCP process at their food premises.

¹ Some, such as the Honey Standard, are used to ensure that the product is authentic honey, and not whether it is safe to eat.
A Critical Control Point (CCP) is the point in the process where hazards must be controlled. It is this point where control is applied in order to prevent or eliminate a food safety hazard. Examples:

- The storage of honey - contamination hazards must be controlled at this point
- The extraction of honey - contamination hazards must be controlled at this point.

The HACCP system is based on seven principles, that work together in a logical series (see Figure 1).

Figure 1. The seven principles of HACCP

| Principle 1 | Identify hazard, for example chemical contamination as a result of storing honey near other substances |
| Principle 2 | Identify the point at which the hazard may occur - this is the Critical Control Point or CCP. For example, the CCP is the honey storage facility |
| Principle 3 | Set a limit for each hazard, this forms the boundary between what is safe and what is not. For example, honey should never be stored in the same room as agro-chemicals, or cleaning fluids |
| Principle 4 | Establish a system to monitor how the CCP is controlled. For example, daily checking of the storage room |
| Principle 5 | Establish the corrective action if a CCP is not controlled. For example, destroy all honey stored next to fertiliser |
| Principle 6 | Establish procedures for checking that the HACCP system is working. For example, every six months the HACCP plan is reviewed by the management team |
| Principle 7 | Establish complete documentation. For example, write down every aspect of the process, list of hazards, CCPs, monitoring system, checking system |

Having understood the seven principles of HACCP these need to be implemented in a Step-by-Step plan (with between 10-14 steps). This plan, and associated documentation, is known as the HACCP plan.

**What does a HACCP plan look like?**

The HACCP plan sets out how the HACCP process is implemented in all food processing premises. Some food safety authorities provide templates or forms, which can be used to develop a complete HACCP plan. It might be useful to ask statutory food safety authorities for templates or ask your EU buyer for an example of the template that they use. Typically, a HACCP plan will include the following steps:

1. Terms of reference - a description of the food process and premises
2. The HACCP team - names of people responsible for HACCP in the company
3. Description of the food process and a flow diagram of the process - this is sometimes called the ‘life story’ of the food product
4. Identification of the Critical Control Points (CCP) for each process
5. Identification of the limits of safety associated with each CCP
6. The monitoring procedures for each CCP
7. The corrective actions which need to be taken when a CCP is moving out of control
8. Verification procedures
9. Procedures for record keeping and documentation
10. A review timetable and process for the HACCP plan

**The main hazards associated with honey**

Honey is classified as an animal product by the EU. Compared with other animal products such as milk or dead fish, honey is an extremely ‘safe’ food. Honey naturally resists microbial activity and does not go off. Honey does not have to be refrigerated and can be kept for a long time, unlike fresh meat or milk.

It is worth mentioning that the level of HMF (hydroxymethylfurfural) is a honey quality indicator monitored by honey buyers, and is not a food safety issue. High HMF does not pose a health hazard and is therefore not part of the HACCP regime. It is covered by the honey standards. The main human health hazards associated with honey are chemical contamination (which can be derived from unclean equipment, contamination from cleaning chemicals and toxic substances present in the honey factory) and physical contamination (such as nuts, bolts, nails, broken glass, dust, debris, insects, pieces of wood). Sensible care and common sense can avoid these hazards.

**Processes which underpin the application of HACCP**

It is important to understand that HACCP is used to control and manage significant hazards and not every day or general hazards. Therefore, HACCP does not cover very basic hygiene practices such as hand washing and general cleaning. It is assumed that all countries that aspire to export food products to the EU have their own national regulations about the hygiene and handling of food products, and it is imperative that honey exporters adhere. An EU buyer may wish to find out about these, and check how they are implemented, in addition to checking the HACCP plan.

**Primary production**

Food handling and processing premises must be covered by a HACCP plan, but what about primary production? Does an apiary or a farm need a HACCP plan? A HACCP plan could be applied at the apiary level but it is not an EU requirement. However, other safety assurance processes apply to primary production. The supplier and the supply system may be covered within the HACCP plan of a honey buyer. For example, the purchase of honey may be set as a CCP and this may be controlled by a company that decides to buy honey only from approved beekeepers - those whom they know follow the proper apiary management practices.

For more information go to BfD’s Information Portal/Markets and Trade/Legislation at www.beesfordevelopment.org

We acknowledge The Wales for Africa Fund of the Welsh Assembly Government support for BfD’s recent work to provide HACCP information to beekeepers in Africa.

**EU BANS HONEY FROM INDIA**

An EU Commission inspection to India has revealed serious deficiencies concerning the implementation of the residue monitoring plan for honey. Therefore, the entries for India concerning honey will be deleted from the list in the Annex to Decision 2004/432/EC.

Further information