This may seem like a complicated process but in practice there are well established safe methods of production for most common types of foods.

For example, consider the production of vacuum packed ham joints. The validation study might make reference to the following documents to validate the HACCP plan, which identifies Clostridium botulinum as a significant hazard and sets critical limits of 90°C for 10 minutes at the critical control point of cooking:

Food Standards Agency guidance on the safety and shelf-life of vacuum and modified atmosphere packed chilled foods with respect to non-proteolytic Clostridium botulinum (2008)

A code of practice for the manufacture of vacuum and modified atmosphere packaged chilled foods 2nd Ed 2009 (Campden BRI)

In addition to this, the validation plan would need to demonstrate that the equipment used to boil the hams is capable of reaching and maintaining this temperature for the required time. Alternatively, should the business decide to cook the joints at 75°C for 45 minutes instead of 90°C for 10 minutes, they would need to produce their own evidence that this would be adequate to control Clostridium botulinum, which might involve the recruitment of specialist consultants and the use of microbiological modelling.

2. Verification

The process of verification involves taking sufficient steps to ensure that the procedures set out in the HACCP plan are working in practice and in particular that the critical limits are sufficient to ensure that the identified hazards are controlled at critical control points.

In practice this can involve the following steps:

- Taking measurements, for example temperatures, at various points along the process to ensure that the system is behaving as expected.
- Targeted microbiological and/or chemical sampling of intermediate and final products to ensure that the food is meeting expected standards.
- Auditing documents throughout the system to ensure that the correct information is captured, recorded and acted upon in accordance with the HACCP plan.
- External audits on suppliers to verify that raw materials meet expected criteria.

Verification

Verification is the principle which confirms that the HACCP plan if followed will produce safe food for the final consumer.

How is this stage achieved?

The process of verification has three key components:
Validation – "Will the HACCP plan ensure that safe food will be produced?"
Verification – "Is the HACCP plan working, is it producing safe food?"
Review - "Is the HACCP plan up to date?"

1. Validation

Validation is the process by which you can prove that all of the judgements and assumptions that you have made to identify and evaluate relevant hazards, identify controls, correctly select critical control points, establish effective monitoring and corrective action procedures are all based on scientific fact. If each and every component of the HACCP system is based on science, then the whole system will be valid.

Validation of the HACCP study could follow the following format:

- Identification of hazards
- You should reference an authority (journal, guidance, textbook) for each identified hazard or record the reasoning of the HACCP team for the inclusion of each hazard in the HACCP plan.
- Evaluation of hazards - an explanation of why a given hazard has been discounted should not be included.
- Selection of critical control points
- You should specify the method used to select critical control points. For example, use of the Codex Alimentarius decision tree. Define critical limits
- Critical limits can often be validated by reference to relevant literature such as legislation or Industry Guides.
- If critical limits are selected then you must demonstrate that your process is capable of operating at the proposed critical limits.
- If there is no published evidence that proposed critical limits will be sufficient to achieve control at a CCP, it will be necessary to conduct suitable validation exercises such as mathematical and/or microbiological modelling supported by challenge testing or other relevant studies.
- Establish corrective actions
- Where a corrective action includes an option to rework or reuse a non-conforming product, evidence must be provided to guarantee that such reuse will result in safe food.

•Analysis of customer complaints and third party audits to identify any potential gaps in the HACCP plan.
•Analysis of waste and rework figures to ensure that they correspond with records of corrective actions.
•Staff assessments to ensure that procedures are fully understood and that staff are competent to perform any tasks allocated to them.
•Trend analysis of monitoring data to determine whether process controls are adequate and tolerances realistic.

3. Review

Your HACCP plan should be up-to-date at all times and reflect any changes that may have taken place since the HACCP study was last carried out. It is recommended that reviews of the HACCP system should be carried out on a routine basis, so all HACCP plans should have built into them a scheduled review which should take place at a prescribed time interval even if nothing has changed.

At an absolute minimum this should be annually and cover all areas of the HACCP plan. Any changes should be recorded and a validation study carried out to ensure that the HACCP plan is still capable of producing safe food.

Once a review has occurred it must be documented even if nothing has changed. Those responsible for carrying out a review (usually the HACCP team in larger businesses) need to ensure that a proposed change does not adversely affect conclusions reached in the HACCP study and compromise product safety, and that the HACCP study is kept up-to-date.

In addition, the HACCP plan should identify circumstances that would initiate or "trigger" a review. Some examples of such triggers might include:

- Changes in raw materials or product formulation
- Introduction of new product
- Change in raw materials supplier
- Change in processing system
- Change in layout or environment
- Modification to process equipment or new equipment
- Failures in system e.g. corrective action or product recall
- Anticipated change in customer or consumer
- Any report from the market place that indicates a health or spoilage risk associated with the product
- Emergence of a new food-borne pathogen (such as bacteria that can cause illness) with public health significance or other health issue
- Changes in legislation

Calibration

Calibration is another task that ensures critical limits for CCP's are met. The most common calibration is for thermometers. If equipment is out of calibration, it needs to be replaced or adjusted. Records will need to be verified for equipment that is outside of calibration limits if the equipment has been used to measure critical limits. The review of the records should focus on the possibility that the measurement of a critical limit resulted in a deviation of the critical limit and a potential food safety hazard occurred. The deviation review should include product produced since the last calibration. Therefore, frequent calibration is encouraged to minimize the amount of product that would need to be reviewed.

Documentation and Records

Records of validation and verification studies are to be kept as evidence that they have been carried out successfully and to assist with a due-diligence defence.