PHR 450, D6
1/30/06, 6p

HACCP Plan Development Using "HACCP Plan Developer" Program, Example: Processed Food

What is food processing or manufacturing ?

(This discounts recent government re-interpretations.)

"Value-added" conversion of raw materials to increase convenience, palatability, stability, and safety — Note that value added with respect to time and place (by storage and distribution) are not exactly included, although they may be part of the processor's HACCP plan for while the product is in the processor's control.

Although this activity is often called "production," please remember that we have tried to reserve that term for the production of raw materials.

Some examples:

Milk is pasteurized and packaged
Milk, etc., become cheese
Flour, etc., become bread
Fish are headed, scaled, eviscerated, smoked, and packaged
Assorted vegetables are cut, mixed, and frozen
Meat, etc., become sausage
Pumpkin is cooked and canned
Cooked chicken broth is canned
Cola beverage is canned
Assorted salad ingredients are cut, mixed, and packaged
Alfalfa seeds become sprouts

Prerequisites (GMPs, SSOPs) were discussed at our first class session.

This evening, we will learn the HACCP Plan Developer (HPD) approach to building a HACCP plan. It is clear that there was HACCP before this software, so there are many other ways to design a HACCP plan. Given the limits of time, we have chosen HPD as a means to make sure that you are guided through the most important aspects of HACCP plan design in a structured way.

Message from Dan Mitchell at the Vet Med Dean's Office — There are supposed to be 7 computers with the HPD software in the 204 computer lab. The following diagram shows which computers have the software. If you find that the diagram is incorrect, please bring it to my attention. Early on, you may wish to explore HPD individually; once the real HACCP plans are being built, you will work in teams; 7 computers will be more than enough.

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OOOH	OOOO	H = computer with HPD software
OOHO	HOOO	O = computer without HPD software
OOOH	HOOO	P = printer
POOH	HOOP	

The lab is also used in teaching specific courses, mainly in the Master of Preventive Veterinary

Medicine program. We need to try not to be in there when classes are being held. Here are the scheduled times for winter quarter MPVM labs that have been sent to me: Mondays, 1–4; Tuesdays, 1–3 (2/14 only); Wednesday, 9–11 (2/1–3/8), 1–3; and Thursday, 1–3 (1/19, 3/2).

At one of the designated computers (be sure it's on), to get the opening screen (with all the icons), click on Enter, the provide your user name and Kerberos password as usual.

- You should next get an opening HPD screen with four left-extending tabs and a separate "Introduction" link.
- View the Introduction carefully, at least once. The video is informative, although the narrator obviously has had limited experience in that role. The Introduction lists the seven HACCP Principles, with 6 & 7 reversed from the order we gave you, and then surveys the various steps in their HPD system.

HDP is built on four sections, each with subsections:

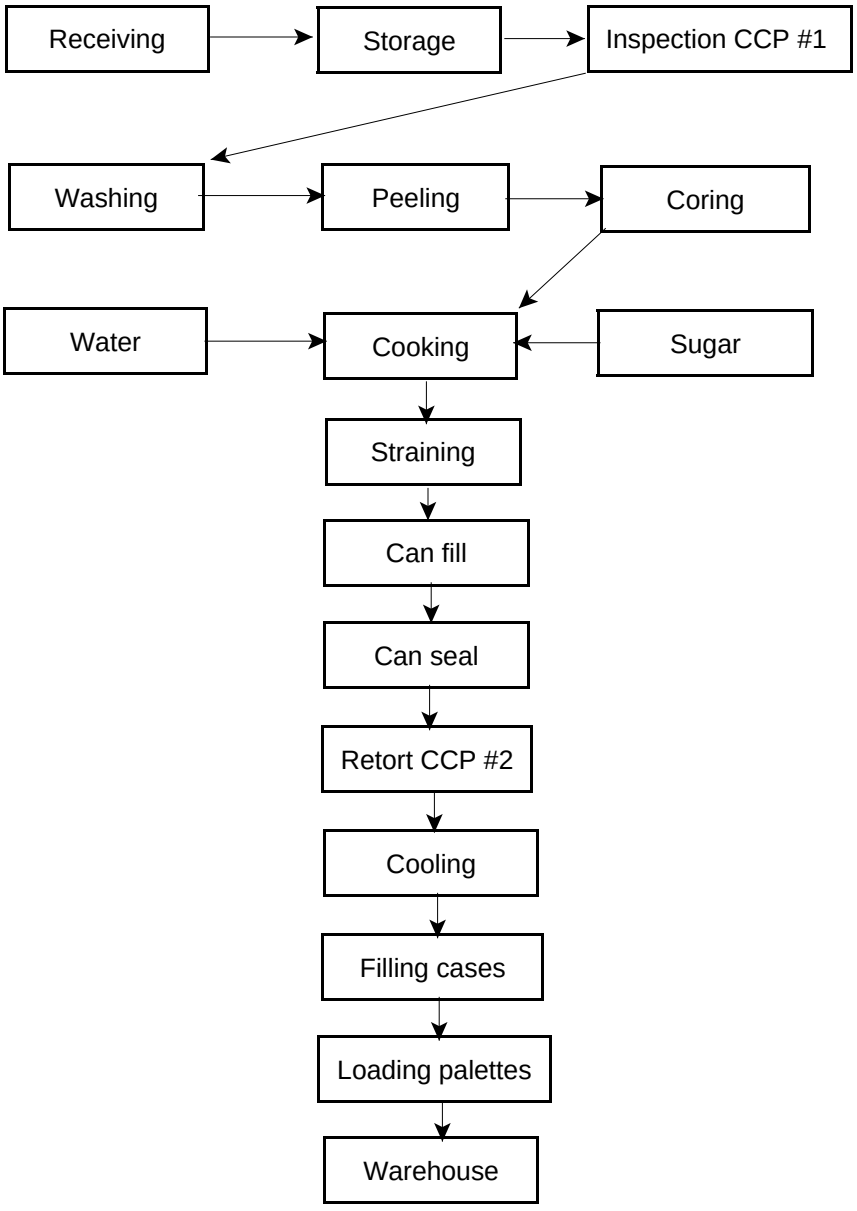
- Pre-HACCP Requirements (These were discussed in our first class session.)
  1) Prerequisite Programs
  2) Management Commitment
  3) HACCP Team
- HACCP Plan Preparation
  1) Product/Process Description
  2) Raw Materials Analysis
  3) Process Flow Diagram
  4) Hazard and CCP Analysis
  5) Recordkeeping
  6) HACCP Plan Reports
- Validation, Verification, and Reassessment
  1) Checklist Generation
  2) Results Entry
  3) Report Printing and Analysis
- Administration
  1) Company and Locations
  2) Team Member Maintenance
  3) Calendar
  4) Program Status

Clearly, not every phase of this is applicable to a class project. However, you should review all of them and use as many as possible, to make the classroom exercise as meaningful as possible. Try to take time to visit each of the options listed above and to view the video linked to some of them. Look at all of each screen, noting any explanatory material near the top, as well as the work area that is provided from the center downward. If you already know what your project food is going to be, you will be able to conclude that some features do not apply to your project; all the same, you should at least understand those that you have not chosen to use. As we review your project with you, you may need to revisit some of the features that you thought unnecessary. Whatever food you choose for your project, you will need to create a flow diagram that shows the various steps that are involved. A simple example of a processed food, canned

applesauce, has been chosen for this demonstration.

- A representative flow diagram appears on the following page.
- The Hazard Analysis identified *Escherichia coli* O157:H7 as a biological hazard and patulin as a "chemical" hazard. Apple juice has been the vehicle in some *E. Coli* O157:H7 outbreaks, evidently because apples that fell from the tree and were soiled with animal manure were used as starting material. Presumably, the same could happen to apples used to make sauce. Because this agent is fairly heat-labile, either the cooking or the retort step could have served as a CCP; the retort step was chosen because it comes later. Patulin is produced in bruised apples by a fungus, *Penicillium expansum*; although it is classified as a chemical hazard by HPD, it is of microbial origin. It is also relatively heat-stable, so retorting may not totally destroy it. Therefore, the pertinent CCP #1 is Inspection, in the hope that bruised apples that may harbor *P. expansum* can be excluded at this stage.
- One is then prompted to set Critical Limits. For CCP #1, these would be subjective observation of the condition of the apples unless some objective means of detecting bruising were available. It is also possible that *P. expansum* could be detected under UV light. The Critical Limits for retorting would depend on whether the pH of the applesauce is above or below 4.6. Foods above pH are "low-acid" and must be retorted at 121°C (250°F) for a minimum time at the center of the can, to prevent botulism; because applesauce is viscous, convection will not improve heat distribution. However, varieties of apples can be selected that are acid enough to ensure that *Clostridium botulinum* could not germinate and grow in the sauce, in which case the retort specifications would simply be based upon preventing spoilage. Note that lids are applied to cans at a very great speed in a cannery, and the lip of the lid and the can body are rolled together by high-speed dies that wear with use. Therefore, the dimensions and integrity of can seals want frequent monitoring; this may be a CCP or part of GMPs.
- HPD then leads you to devise Monitoring Procedures, plan Corrective Actions, and devise Verification Procedures and Recordkeeping Procedures, including providing model thermal processing logs, etc.
- The HPD software structures your entire report, which you can view in "file" at "preview." This is worth doing, since the computers in the lab share just two printers. You will not be able to save your work electronically to take home, so get your draft the way you want it and then print a final version to view and mark up when you are away from the lab.
- Another example and more details will be provided during the next period.

Plan: applesauce



Approved by:_____

Date:_____