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Plant Based Protein Case Study

Application:

Mix, hydrate, emulsify, and texturize protein with binders and flavors to create a plant-based meat analog.

Challenge:

Sufficiently hydrate the powders and **emulsify** with fat. Determine the upper limit of protein ratio. Incorporate the final thickening/texturizing solution into the end of the mix. Add heat and prove the Continuous Processor can **achieve a final product exit temperature of at least 166°F** as a kill stop.

Process Conditions:

Protein Powder	16%
Binder	4%
Water	70%
Fat	5%
Emulsifier and Flavor	5%
Feed Rate	800 lb/hr
Shaft Speed	200 RPM

Solution:

The process steps included hydration, emulsification, texturization. The paddle arrangement was critical. The **jacketed barrel** temperature of 510°F yielded 167°F product discharge temperature, and served as an effective kill step per the customer's requirements.
The final texture of the product compared very well to the customer's benchmark samples.

Benefits:

Using the extended length 10:1 L/D 5" **Continuous Processor allowed several operations in one pass through the mixer**. The flexibility of injection port locations, paddle and screw orientation, and excellent thermal transfer of the jacketed barrel made the Continuous Processor a great solution for this application.

Continuous Processor—CP

Features and Benefits:

Customized Paddle Arrangement

Shorter Cycle Time

Fewer Process Steps

Less Waste

Product Consistency