	Retail-foodservice Food Safety Consortium (LLC) Dr. Brian A Nummer, PhD.702 Eagle View Drive Providence, UT 84332 | PH 435-213-6154
4/17/2019	**PROCESS RISK ANALYSIS LETTER**
Issue	**Should reheating for hot holding and/or hot holding of cook-chill or sous vide (CC-SV) foods be CCPs in the ROP HACCP plan?**
Background	Under the food code both cooking and cooling of foods have required temperature parameters. Monitoring is implied; however, the food code does not require record keeping. Record keeping is only recommended under Active Managerial Control. Under HACCP all CCPs must require both monitoring, recordkeeping, and verifications. By designating reheating and hot holding a CCP, then by food requirements under HACCP, all reheating and hot holding temperatures must be monitored, recorded, and verified. This would be in contrast to non-ROP foods that are not under a HACCP plan and would not require records or verifications. As a RTE food, CC-SV foods would only require reheating to 135°F for hot holding. Most often, CC-SV foods placed in hot holding are removed from their ROP bags.
Scientific rationale (validation) Risk Analysis	1. CC-SV foods, fully cooked and properly cooled in hermetically sealed bags, are considered ready-to-eat. a. Following the food code requirements for cooking, all vegetative pathogens would have been eliminated by approx. 5-7D (logs). b. Following the food code requirements for cooling, results in ≤ 1 log C. *perfringens* and no possible outgrowth of *B. cereus* or C. *botulinum*. 2. C. *perfringens* is a toxico-infection pathogen. It requires ingestion of approximately 1x 10^{6th} vegetative cells/g food to produce enough toxin in the intestinal tract to cause food borne illness. 3. C. *perfringens* upper growth limit is 126°F, while the food code hot holding minimum is 135°F. a. Food held > 126°F will never be a hazard for C*p*.

	b. Food held at 126°F requires 3.5h to increase 1 log and 7.5h to go from 1 - 6 logs (amount required to produce C*p* illness)(Combase data). c. Food held at 120°F requires 2h to increase 1 log and 4.6h to go from 1 - 6 logs (amount required to produce C*p* illness)(Combase data). 4. There are journal articles describing the fact that C. *perfringens* vegetative cells are destroyed slowly at refrigeration temperatures and more rapidly at freezer temperatures. Therefore, cold holding ROP foods adds to food safety (it is noted that USDA FSIS chooses not to account for any cold holding lethality when modeling C*p*).
Recommendations	**As a food microbiologist and subject matter expert in special processes under the US FDA model food code, I believe that it not a benefit to food safety to designate either reheating for hot holding or hot holding of CC-SV foods as CCPs. Here are my opinion points:** • **Reheating and hot holding are currently controlled under the food code for all foods not just ROP.** • **The risk of hot holding deviations resulting in foodborne illness from RTE foods is low.** • **A failure to properly cook would leave vegetative pathogens present and a failure to properly chill foods would increase the potential log growth of Cp. Under a HACCP plan, neither should occur.** • **Increasing the complexity of CC-SV from four standard CCPs (cooking, bagging, chilling and cold holding) to six (adding reheat and hot hold) results in the possibility that operators reduce their attention from proper cooking and chilling.** • **It is only a technicality, but ROP HACCP would typically cover foods from placement into ROP bags to removal from ROP bags. Foods are usually removed from bags once placed into hot holding.** **Issue recommendation | Focus food safety attention and efforts on the four main CCPs of CC-SV (cooking, bagging, chilling and cold holding) and leave reheating fo hot holding and hot holding controls the same as for non-ROP foods under the food code.**
Signed	**Dr. Brian Nummer, PhD.** Brian.nummer@usu.edu Brian Nummer Digitally signed by Brian Nummer Date: 2019.04.17 09:37:15 -06'00'