FUMIGATION ANALTERNATIVES FOR THE HAM MITE, *TYROPHAGUS PUTRESCENTIAE*: CHALLENGES AND PROSPECTS

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The ham mite, *Tyrophagus putrescentiae*, is the most serious arthropod pest infesting southern dry cured hams in the USA, The mite is distributed world-wide and infests dried meats, cheeses and pet foods with high fat and protein content, and moisture greater than 15 %. Methyl Bromide (MB) has been the most effective, and essentially the only, pest control method used by the dry cured ham industry to manage ham mite infestations. The potential loss of MB calls for an effective alternative in the form of a fumigant that can be applied over a few days, has no impact on food quality and can effectively reduce or eliminate mite infestation with minimal cost relative to the benefit of protecting the ham products. In past years we evaluated the fumigant sulfuryl fluoride for the ham mite at 25 C for 48 hrs and we could not eliminate the egg stage to the level that would effectively control pest mite populations. However, in laboratory testing, phosphine was effective against all life stages within the label rates of the fumigant, and dried meats are already listed on the application label.

We participated in a commercial fumigation of a working ham production facility with phosphine gas in early 2013. Two rooms were selected for treatment and each had several hundred hams that had were in the late first or second year of aging. Magnesium phosphide was chosen as the application material because it produces twice as much hydrogen phosphide, PH_3, and at a faster rate, than does aluminum phosphide. Each room was well sealed and access of gas was restricted to electrical and heating-air conditioning systems. Gas concentrations of 1500 ppm and 700 ppm were reached within 12 hours of initiation in each room, and these levels were maintained in each room for the duration of the 48 hr treatment. Another full day was required for de-gassing and clearance of the facility before workers were allowed back in. Ventilated mite colony jars placed in treated and untreated spaces during the PH_3 application confirmed that mortality of ham mites was very high in the treated rooms. Unfortunately, corrosion to electrical wiring and equipment was discovered as unacceptably high about 21 days after the treatment. Work needs to be done to properly prepare ham production facilities for the corrosion potential of phosphine gas before application of this fumigant is recommended as a MB alternative for country hams

Research continues on fumigation alternatives for ham mites. We have revisited sulfuryl fluoride to determine if its efficacy against mite eggs could be improved at higher fumigation temperatures and longer gas exposure times. Preliminary studies suggest the a treatment temperature of 35 c for 48 hrs at a high sulfuryl fluoride concentration can control all ham mite life stages. The planned direct of new research for the next two years will be elaborated.