PREDICTING CORROSION RISK IN SOUR BEERS STORED IN ALUMINUM BEVERAGE CANS AS A FUNCTION OF CHEMICAL COMPOSITION

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PRIMARY GOAL(S):

Sour beers are reported to suffer from premature corrosion as compared to conventional beers. However, the specific roles of sour beer components (e.g., acetic acid, lactic acid) in promoting corrosion are unclear. We propose to: 1) determine components in sour beers that enhance the rate of corrosion by lactic and acetic acids, and 2) develop a predictive model for corrosion and estimate product shelf life based on concentrations of lactic, acetic, and other critical components.

BACKGROUND:

Sour beers and related fermented products (e.g., kombucha) have undergone rapid growth in recent years. Producers often wish to utilize aluminum beverage cans as packaging. However, producers of sour beers anecdotally report greater incidence of corrosion and shorter shelf lives, and our lab group has recorded more dissolved aluminum (a proxy for corrosion) after incubation of sour and non-sour beers with lined aluminum. In sour beers, the main organic acids (lactic and acetic) are suspected to facilitate corrosion and limit shelf life, but studies to establish critical components or appropriate limits are not available. Our group has similarly reported on factors in wines that limit shelf-life, e.g., a synergistic effect between free SO_2 and pH, and we are thus well-positioned to extend these studies to sour beers.

ADDITIONAL INFORMATION:

Results and conclusions, including a simplified "points" approach to risk assessment, will be shared with the Brewers Association in both written and video reports. We expect this work to expand understanding of compounds responsible for the corrosivity of sour beers, provide new tools for predicting corrosion or appropriate adjustments, decrease incidence of premature can failure, and facilitate an evidenced based approach to improving product shelf life and quality.