

The use of unmalted triticale in brewing and its effect on wort and beer quality

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The brewing properties and economic relevance of modern triticale were investigated in comparison with those of 100% malt and commonly used brewing adjuncts (brewers' rice, maize grits, or barley). Pilot-scale brews were performed with adjunct ratios of 0, 25, 50, and 70% supplemented with enzymes. Using triticale, starch solubilization properties were slightly superior, and amylolysis was similar to those of traditional adjuncts. Triticale worts displayed soluble nitrogen contents in the same range as those of all-malt worts. Amino acid levels with triticale clearly exceeded those of other adjunct worts. Consequently, fermentation capacity and limit attenuation of fermentable carbohydrates were improved. Regarding the final product, addition of triticale enhanced the foam stability and substantially reduced the amount of polyphenols derived from malt. On the other hand, compared with 100% malt, use of 25% triticale increased the wort viscosity by 10% and decreased the beer filterability by 12%. **Sensory evaluations on a sound statistical basis favored triticale beers toward other adjunct beers. Accounting for the commercial aspects, use of triticale results in significant savings in extract recovery when compared with common adjuncts. The data presented in this work strongly indicate that triticale is highly suitable to serve as a brewing adjunct.**