Guidelines for S-1041 Poster Abstracts and Presentations
First Call – February 7, 2018

Presentations: July 9 and 10, 2017
Location: USDA Forest Service Forest Products Laboratory, Madison, WI

Due: Poster Abstracts are due **by June 8, 2018**

Abstract Format:

- Ragged right margin (align left)
- 12 point font
- Times New Roman typeface
- No hyphens at ends of lines
- Citations within the abstract are allowed
- Use Numbered citation and reference format; see example
- Up to 2 pages, including figure and/or table
- Color printing is allowed; 1 figure and/or 1 table is allowed, within page limits
- Keep in mind that figures and tables must be large enough for ease of reading

By June 8, 2018, email poster abstracts to:
Mike Tumbleson, mtumbles@illinois.edu

Proceedings:

Kent Rausch and Mike Tumbleson will edit, finalize format and prepare abstracts for printing in the S-1041 symposium proceedings. A title page, list of participating institutions, past meeting sites, tentative agenda, table of contents, poster abstracts and author index will be part of the published proceedings. Papers from symposia speakers may also be included. Proceedings will eventually be posted on the S-1041 website.

Poster Format:

- Dimensions will be provided at a later date
- Poster boards, easels and poster pins will be provided

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Format example – Note Numbered citation format, 1-2 pages allowed, tables or figures ok, color ok

Submit abstract to mtumbles@illinois.edu by June 8, 2018

PROTEIN EFFECTS ON HEAT TRANSFER FOULING USING MODEL THIN STILLAGE FLUIDS

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Fouling is the unwanted deposition of materials on surfaces of processing equipment, which leads to additional investment, lower processing efficiency and potential fluid contamination [1]. In the corn ethanol industry, fouling occurs when thin stillage is concentrated into condensed distillers solubles. Researchers have investigated operating conditions and constituents' influence on fouling characteristics of thin stillage [2-4]. However, research related to protein effects on thin stillage fouling is limited despite its relatively high concentration in thin stillage (33% db) [5].

Protein contributions to fouling have been verified in the dairy industry. Whey proteins, together with phosphate-calcium, interact with each other and form aggregates deposited on heated surfaces [2, 6, 7]. Maillard browning is an additional potential factor influencing fouling since amino acids in thin stillage are able to react with reducing sugars and form brown pigments. Proteins, as well as their hydrolyzed products amino acids, with accompanying sugars in thin stillage, contribute to fouling. Due to the diverse components in commercial thin stillage, it is difficult to study a single effect on fouling without interference from other factors.

The objective was to investigate protein effects on fouling using various model thin stillage fluids with simplified compositions. Nitrogenous substances (urea, yeasts, glutamic acid, leucine and cysteine) were mixed with glucose. Fouling was characterized by fouling resistance, induction period and fouling rate. Compared with a 1% starch model, no fouling occurred during testing using glucose-urea fluids. Addition of urea reduced maximum fouling resistance by 29%. Molecular weight, as well as protein structure and properties, may affect evaporator fouling.

LITERATURE CITED {PLEASE FOLLOW THIS FORMAT}

1. Lalande, M., F. Rene and J.P. Tissier. 1989. Fouling and its control in heat exchangers in the dairy industry. Biofouling 1:233-250.
2. Wilkins, M.R., et al. 2006. Effect of pH on fouling characteristics and deposit compositions in dry-grind thin stillage. Cereal Chem. 83:311-314.
3. Challa, R., et al. 2015. Fouling characteristics of model carbohydrate mixtures and their interaction effects. Food Bioprod. Proc. 93:197-204.
4. Singh, V., C. Panchal and S.R, Eckhoff. 1999. Effect of corn oil on thin stillage evaporators. Cereal Chem. 76:846-849.
5. Rausch, K.D. and R.L. Belyea. 2006. The future of coproducts from corn processing. Appl. Biochem. Biotechnol. 128:47-86.
6. Visser, J. and T.J. Jeurnink. 1997. Fouling of heat exchangers in the dairy industry. Exp. Thermal Fluid Sci. 14:407-424.
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→ Use of "et al." in the author list is not necessary but can be used if page length is an issue.