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## **Effect of condensed distillers solubles and drying conditions on the flow and compression characteristics of wheat distillers dried grain with solubles**

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Product variability is one of the challenges that currently confront wheat distillers grain with solubles (DDGS) production and handling in western Canada, with the condensed distillers solubles:wet distillers grain (CDS:WDG) blending proportion identified as one of the possible causes. This study examined the effect of varying CDS:WDG blends on the composition, flow, and compression characteristics of wheat DDGS. Samples with varying CDS level (15%, 30%, and 45%, by mass) were prepared and dried under forced air convection, microwave, and microwave convection methods. Proximate composition was determined using AOAC procedures. The flowability and floodability potential of the material was assessed through measurement of 7 properties using a powder characteristics tester. Compression characteristics were also evaluated using an Instron testing machine and described using selected models. Regardless of the drying method used, protein and ash content increased while fat and fiber decreased when CDS level increased. Compressibility and uniformity index consistently increased as CDS level increased while dispersibility decreased. Flowability, in general, decreased with increased CDS incorporation. Wheat DDGS samples had fair to good flowability, sometimes requiring vibration/agitation to assure flow. The materials were classified as floodable, requiring some measures to prevent flushing. The Kawakita-Ludde model adequately described the compression characteristics of wheat DDGS. Pellet density and failure stress

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increased with increase in CDS while initial porosity of the samples decreased. Aside from CDS:WDG blending proportion, drying air temperature and microwave power level also had significant effect on flow and compression characteristics.