



<b>Event</b>	Montreal (CA), ICAR 2022 Annual Conference	<b>Title of the presentation</b>
<b>Subject</b>	Abstract presented manuscript as ORAL presentation	Estimates of genetic parameters for environmental efficiency traits for first lactation Holsteins

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**Session:** Recording and selection tools for feed efficiency and environmental impact

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## **ABSTRACT**

Efficiency and sustainability are topics of importance in livestock production. Since traits related to sustainability and efficiency are typically expensive and time consuming to measure, the use of indicator traits is of great interest. One potential trait that can be easily measured on farm is the time a cow spends ruminating. Rumination time can be measured by automated sensors, such as rumination collars, which are already utilized for disease and heat detection at the commercial level. To evaluate the use of rumination time as an indicator trait for feed efficiency and methane emission in dairy cows, genetic parameters and the genetic relationships between rumination time and feed efficiency and methane emission were estimated. A total of 7,782 records on 656 mid-first lactation Canadian Holstein cows from the Ontario Dairy Research Centre were evaluated using single-record animal models (rumination time and methane emissions) and repeated record animal models (energy corrected milk, metabolic body weight, and dry matter intake). Feed efficiency was defined as dry matter intake adjusted by a recursive linear transformation using the genetic (co)variances among dry matter intake, energy corrected milk, and metabolic body weight. Moderate heritabilities for rumination time ( $0.48 \pm 0.14$ ) and methane emission ( $0.43 \pm 0.11$ ), and a low heritability for feed efficiency ( $0.12 \pm 0.06$ ) were estimated. The genetic correlation between rumination time and methane emission showed a trend to be moderate ( $-0.45$ ,  $P=0.075$ ), while the estimated genetic correlation between rumination time and feed efficiency was not different from zero ( $-0.08$ ,  $P=0.675$ ). While these results should be validated in larger datasets, they may suggest that rumination time has potential to be used as an indicator for methane emission. :



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