Agriculture is an extremely important industry in Canada. The agricultural sector in Canada contributes of $100 billion to Canada’s Gross Domestic Product annually. Canada is the 5th largest agricultural exporter in the world, with over 2 million people working in agriculture or agri-food industry in Canada (representing almost 1 in 8 jobs). Globally, it is estimated that over one-third of the world’s labour force is employed in Agriculture.

Agriculture is also a very hazardous industry in Canada and globally. As an industry, it represents a wide range of practices, products, machinery, plants, and animals in both indoor and outdoor settings and a wide range of climates. Even within countries and within regions in countries there could be a very diverse range of production practices and occupational risks. The intensity of manual labour or use of mechanization and equipment varies across regions in Canada and globally depending on a variety of factors, including the level of development. As diverse as the industry is, there is equal diversity in occupational exposures, risk awareness, and risk mitigation strategies including regulation.

Agriculture in Canada, like elsewhere, is a risky occupation from a workplace health and safety point of view. Exposures occur across all major hazard categories including chemical (e.g. gases, dusts, pesticides), physical (e.g. noise, vibration, heat, cold), biological (e.g. zoonoses, bioaerosols, allergens, sharps), ergonomic (heavy lifting, repetitive activity, prolonged postures), and psychological (stress, burnout, anxiety, depression). There is a longstanding and growing need for research and prevention efforts and strategies to mitigate risk in this industry.

The Canadian Centre for Health and Safety in Agriculture (CCHSA) was founded in 1986 by Dr. James Dosman, a respirologist who recognized this important need in rural Saskatchewan and Canada for research and outreach in agricultural and rural health and safety. The Centre is located at the University of Saskatchewan in Saskatoon, Canada and is home to a 5.8 million dollar Canada Foundation for Innovation-funded National Agricultural Industrial Hygiene Laboratory, consisting of a number of labs engaged in research in agricultural health and safety, rural health, rural dementia care, aboriginal health, and occupational health.

CCHSA is also home to the Agricultural Health and Safety Network, a one-of-a-kind voluntary network of participating rural municipalities, representing approximately 26,000 farm families, that receive rural and agricultural health and safety resources and education, including workshops, webinars, hearing and respiratory clinics, school programs, access to resources, and a biannual newsletter. The Network is the only one of its kind in Canada. The Centre and Network cooperate with many partners, such as the Canadian Agricultural Safety Association, to promote agricultural health and safety nationally. The Centre has spearheaded seven international symposia in agricultural and rural health that have helped shape science in this area.

The Centre is presently home to approximately 10 million dollars in active research. Injuries and fatalities in agriculture are a significant concern and one area in which ongoing research continues nationally, led by the Canadian Agricultural Injury Reporting program (CAIR) through CCHSA. CCHSA contributes Saskatchewan data to this program.

In Canada, between 1990 and 2012, there were over 2300 fatalities, with an average of 101 per year (CAIR 2016). Most fatalities occur in older farmers, and the highest rates of fatal injury also occur in older age groups, with most fatal injuries being a result of contact with machinery (70%) including rollovers and runovers.

CCHSA is home to the Rural Dementia Action Research (RaDAR) team, an interdisciplinary and international group of knowledge users and researchers lead by Dr. Debra Morgan with the goal to improve primary health care delivery to people with dementia in rural and remote settings.

The vibration and ergonomics lab hosts a wide array of field and lab-based equipment appropriate for occupational exposure and ergonomic assessments, with active projects in vibration and ergonomic exposures and risks in farmers. The Saskatchewan
Farm Injury Study, led by Drs. William Pickett and James Dosman, is a comprehensive longitudinal two-phase study covering over ten years examining relationships between injury outcomes and risks on farms, and to understand experiences of vulnerable populations including young and older workers.

Recent work has suggested a three-fold reduction in injuries among farmers using at least four steps of a modified ‘hierarchy of controls’\(^1\). A novel qualitative study published in 2018 provided significant insight into the decision-making process Saskatchewan parents employ when bringing their children to the worksite on Saskatchewan farms\(^2\). CCHSA is also home to active research in the areas of rural health, childhood asthma, longitudinal analysis, and the emergence of diabetes among Canada’s Indigenous peoples. Innovative work in the hygiene lab is helping characterize the nature of organic dust exposures and their effects \textit{in vivo} and \textit{in vitro}.

Rural work presents a significant array of challenges from a health and safety point of view, with agriculture often being a dominant industry in that setting in Canada and particularly in Saskatchewan. Efforts to delineate risks and to provide effective prevention solutions through research and outreach are an ongoing and growing need.

**REFERENCES**