



Saskatchewan Farmers Back Study Report

*Thank you to all who participated in the
Farmers Back Study!*



With your help, during the 2015 growing season we were able to:

- Visit 22 farms up to 3 times over the year
- Recruit 54 farmers and farm workers
- Measure posture for 98 days
- Measure vehicle/machinery vibration for 80 rides
- Video record 48 farm tasks
- Collect end-of-day questionnaires on work tasks for 98 days
- Collect comprehensive winter questionnaire for 32 people
- Conduct interviews on safety modifications with 23 people
- Conduct interview on back pain experience with 12 people



Study Participants

Although the sample size was small, the Farmers Back Study had a range of participants. Participants were adults from central Saskatchewan who worked more than 12 weeks on a farm per year.



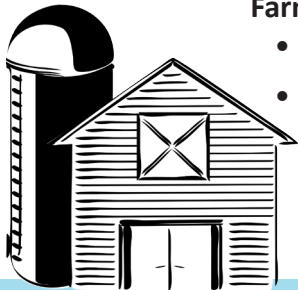
31 farmers:

- 30 men, 1 woman
- Average age: 52 yrs
- Age range: 21 to 84 yrs



Roles on farm:

- 21 primary operator/owner
- 3 spouses
- 4 other relatives
- 3 employees

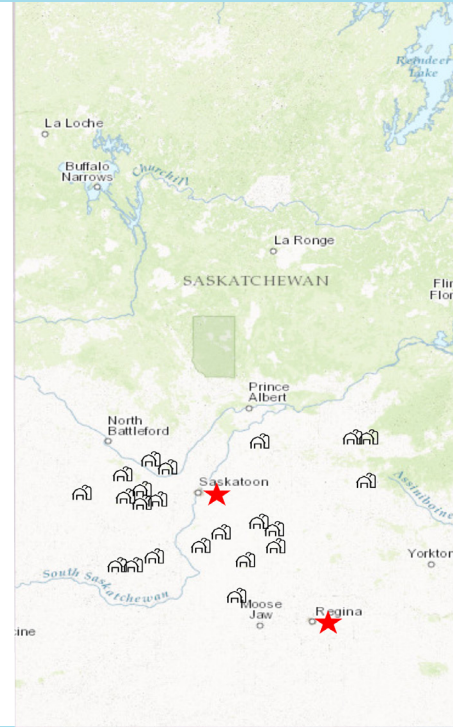


Farm size:

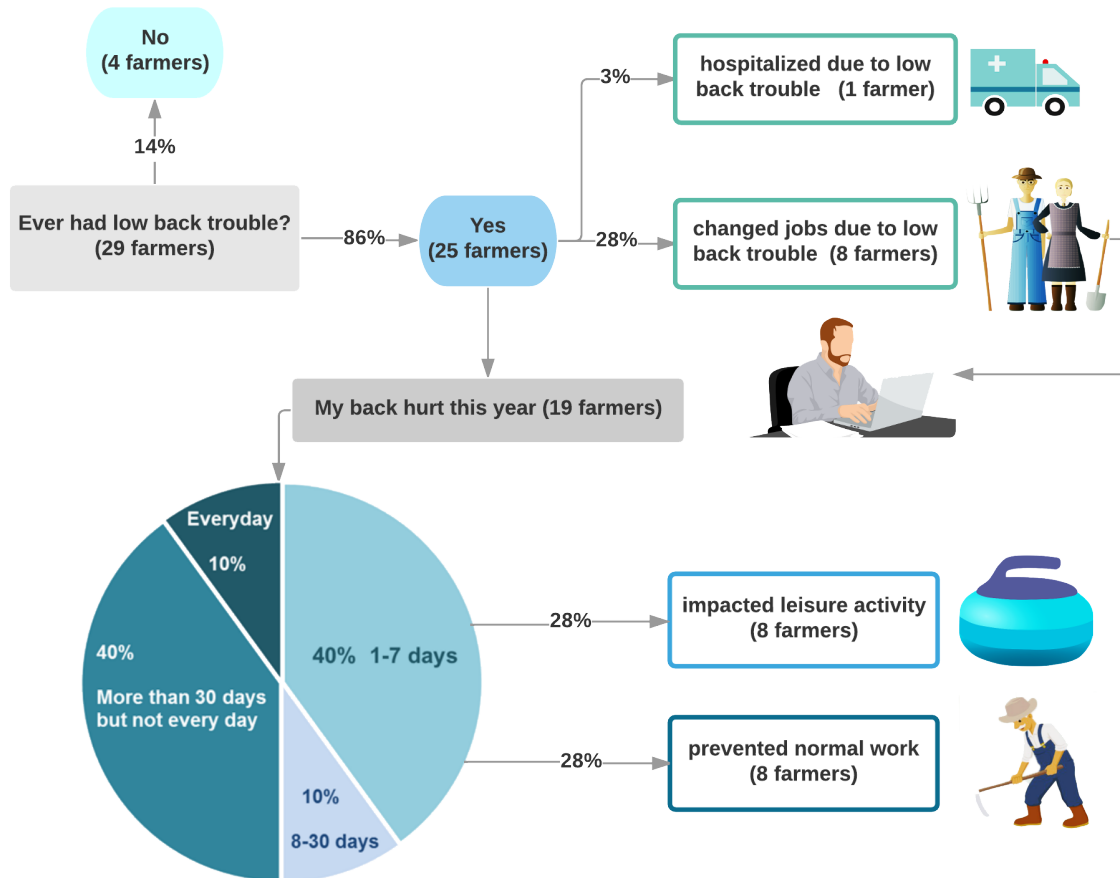
- Average size 4,000 acres
- Size range: 960 to 12,000 acres

Farm products:

- 14 grain
- 6 mixed (grain & animal)
- 2 animal (beef, sheep)



Low Back Symptoms



We collected comprehensive information on back pain from 32 farmers and farm workers using a questionnaire.

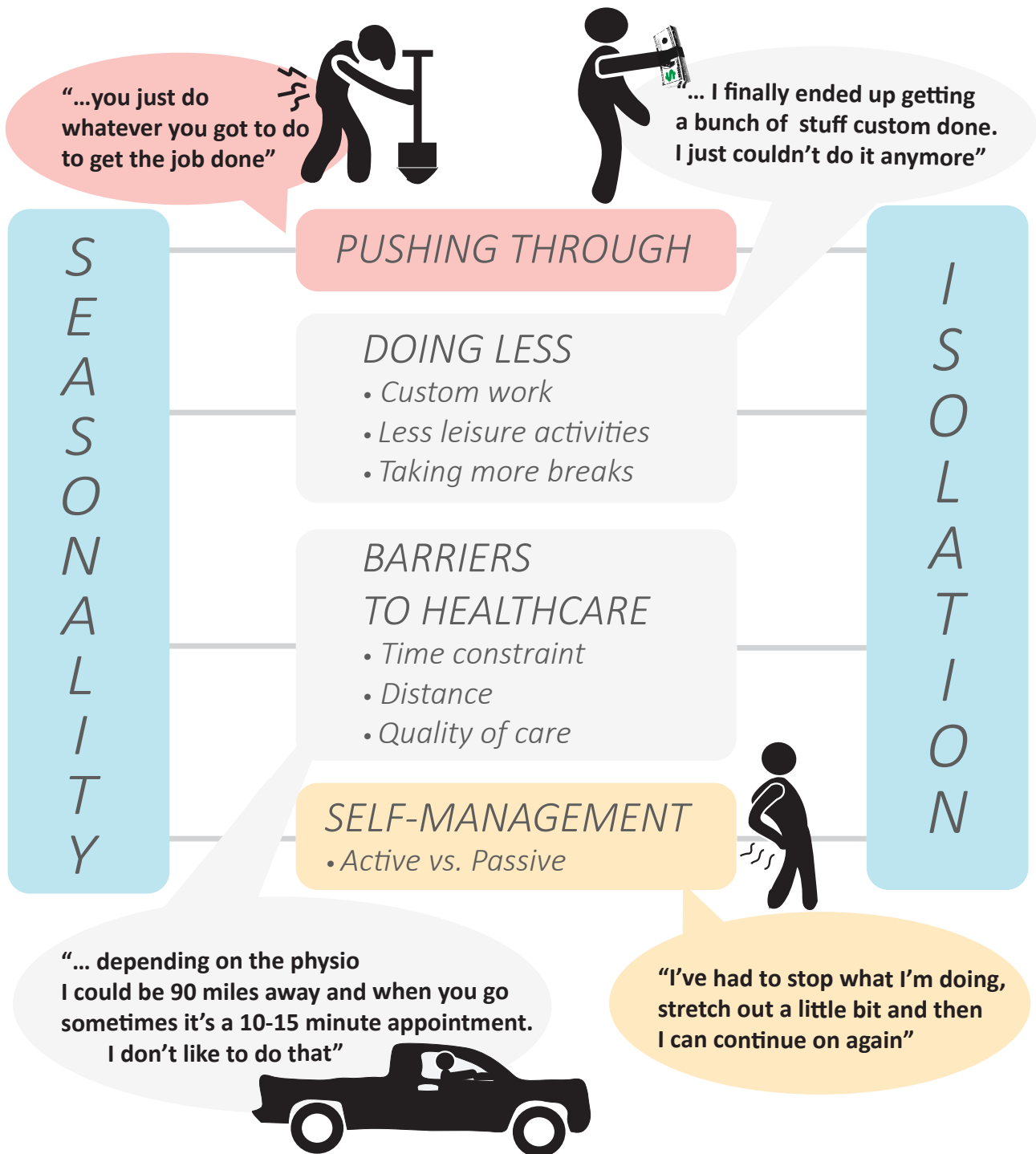
This figure shows how many farmers were affected by back pain and how severe it was.



Experience

We conducted interviews with 12 farmers who had back pain.

Findings show that geographic isolation and seasonality strongly influence experiences farmers have with back pain. Quotes give examples of sub-themes like barriers to healthcare and pushing through to get work done.



What does this mean to you?

- Farmers have a unique work context that can affect their management of back pain.
- Farmers have additional barriers to accessing our healthcare system, which may lead to health inequalities.
- Farmers often describe using self-management strategies to cope with back pain.
- Our findings suggest more effective prevention and management strategies along with better access to healthcare may help reduce the impact of back pain for farmers in rural farming communities.

Whole-Body Vibration

What is whole body vibration?

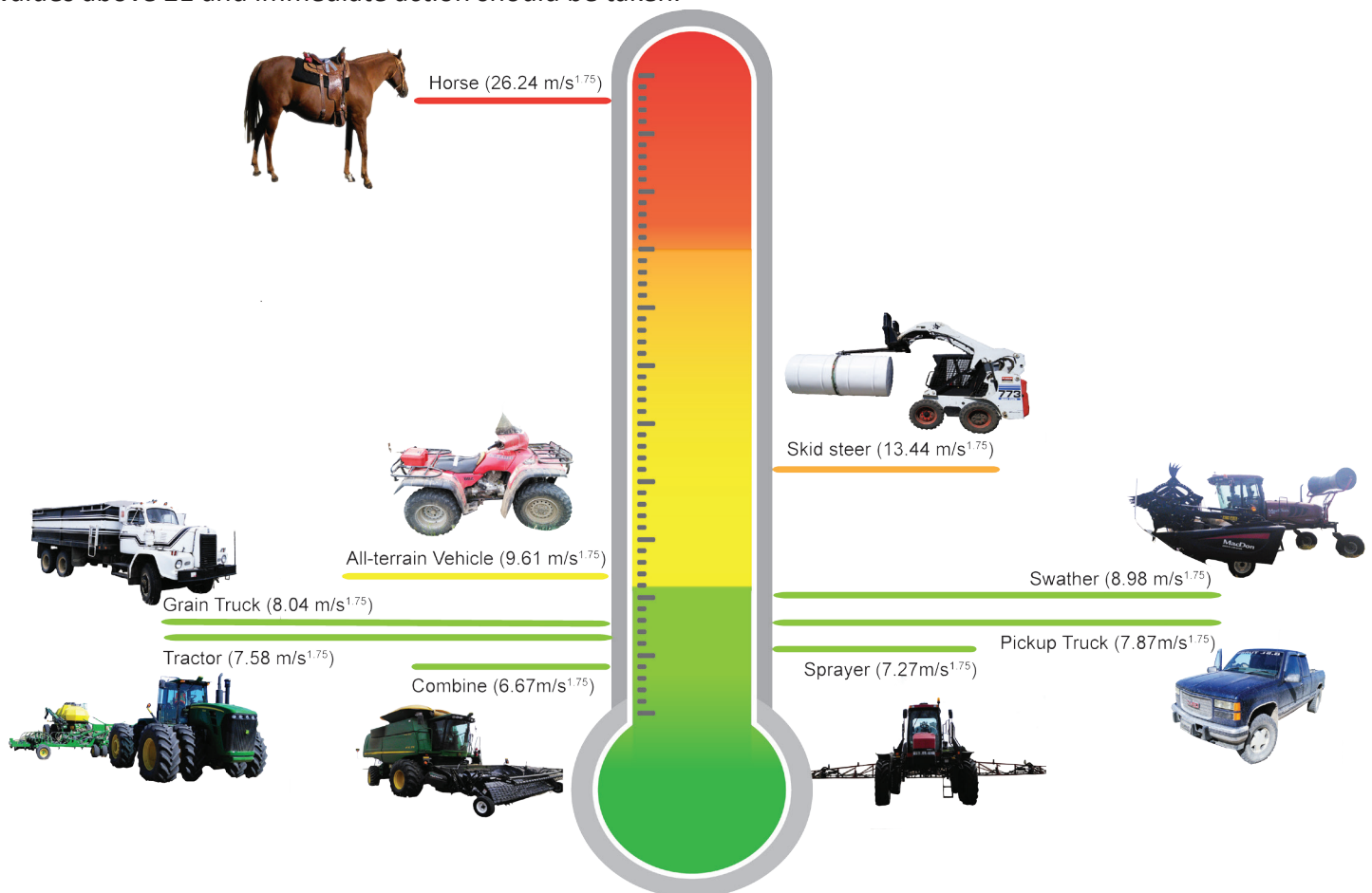
Whole body vibration is produced by mobile equipment like farm machinery. Farmers experience whole body vibration on a daily basis which may lead to low back pain.

What did we measure?

- 40 male farmers during different driving tasks
- 87 vibration measurements on 8 different machineries types
- 2 vibration measurements on horseback in ranch farming

What did we find?

Vibration is measured in units of 'vibration dose value' or VDV. In this graph, measurements in the **green zone** are below 9.1 and considered 'low risk' for health effects; the **yellow zone** is between 9.1 and 21 and is considered to include some risk for back pain and action should be taken to reduce exposure. The **red zone** is vibration doses values above 21 and immediate action should be taken.



What does this mean for your back?

- Small machines (ATV or skid steer) had highest vibration levels; limit time on these equipment to about an hour per day.
- Large machinery (e.g. combines) produce lower levels of vibration, but vibration dose will increase with duration; take breaks, swap driving roles, or limit long driving days.
- Based on machinery guidelines, riding a horse for 30 minutes produces high vibration that may be harmful, but more research needs to be done on horses to be sure.

Machinery Noise

What is noise?

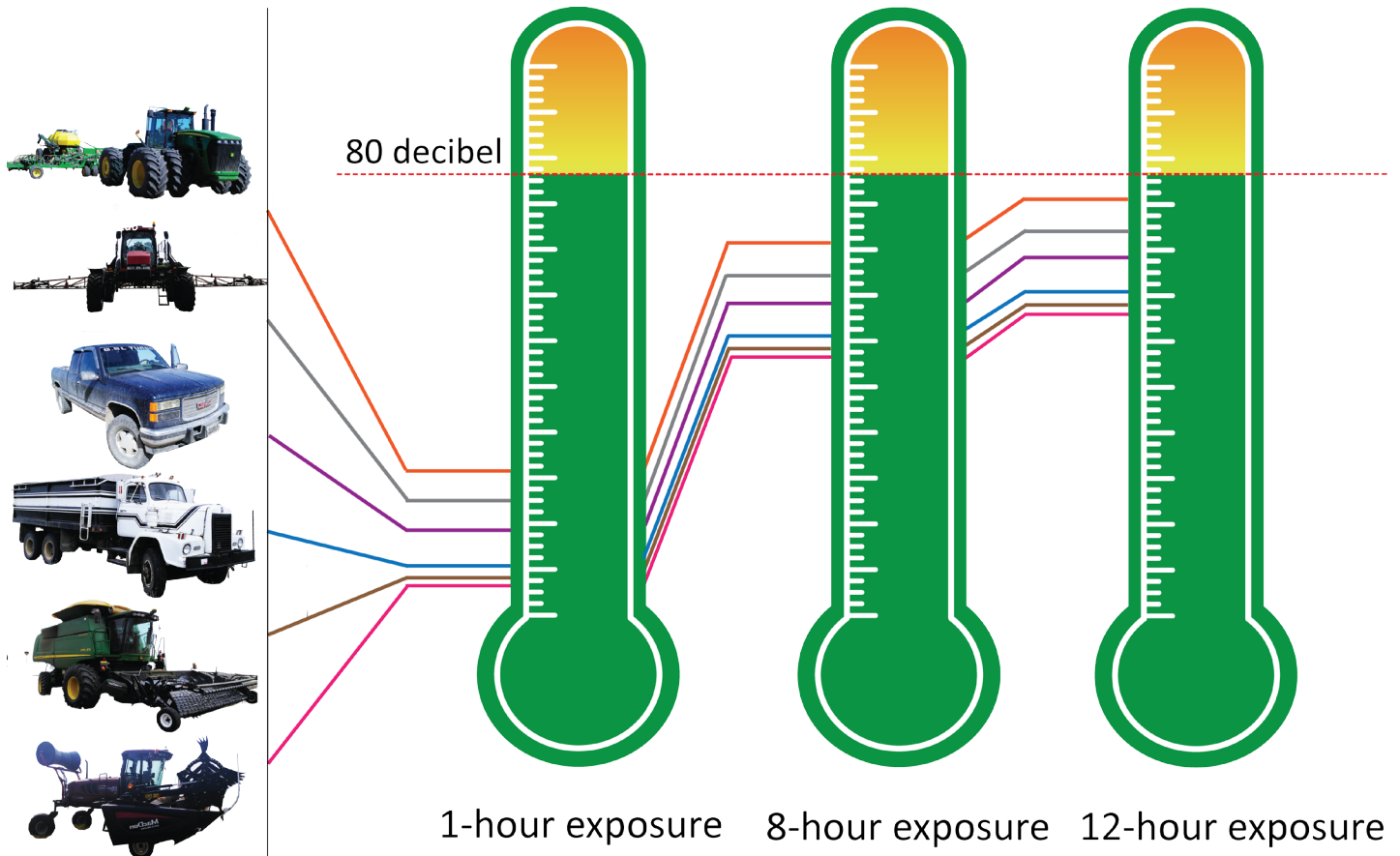
Noise is unwanted sound, and high levels of noise can lead to hearing loss. On the farm, mobile machinery can produce noise on the farm.

What did we measure?

Noise was collected inside the mobile machinery cab during farming tasks. In total, we measured 24 noise measurements on 6 different machinery types: tractor, sprayer, pickup truck, grain truck, combine, and swather.

What did we find?

Noise is measured in units of 'decibel' or dB. In this graph, the **green zones** are below 80 dB and considered low risk; the **yellow zones** are above 80 dB, when the 8-hour exposure reaches and exceeds 85 dB, protective action should be taken to reduce exposure.



What does this mean for your hearing?

- All the machinery types measured in our study show noise exposure at a safe level. However, we did not measure augers, grain cleaners, or concentrated animal feeding operations.
- We only measured inside the cab, but the noise level outside the cab around the large machines can damage your hearing.
- Tractors and sprayers tended to be louder than combines or swathers.
- Just like vibration, noise dose increases with time of exposure. This is shown in the graph as duration increases from 1 hour to 12 hours, dose approaches the yellow zone.

Working Posture

What is awkward working posture?

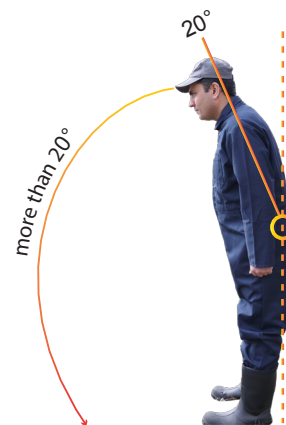
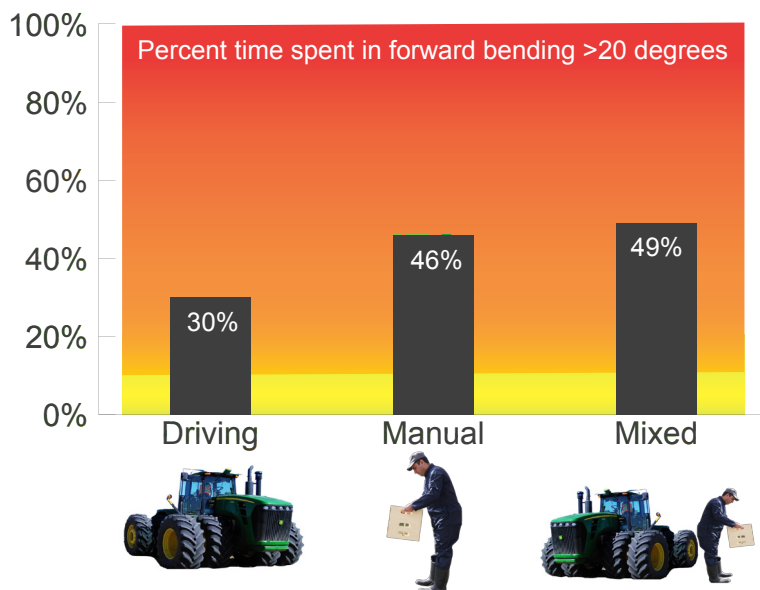
Any movement out of a neutral, upright posture can be considered to “awkward posture”. This can include stooping, bending, looking overhead, reaching above shoulder height, squatting, and kneeling. Awkward postures can force muscles to work harder and stress other body structures like ligaments and discs. Sustained and repetitive trunk bending are known to increase the risk of low back pain.

What did we measure?

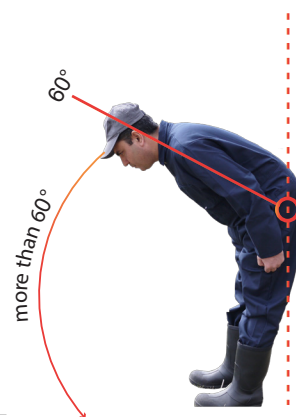
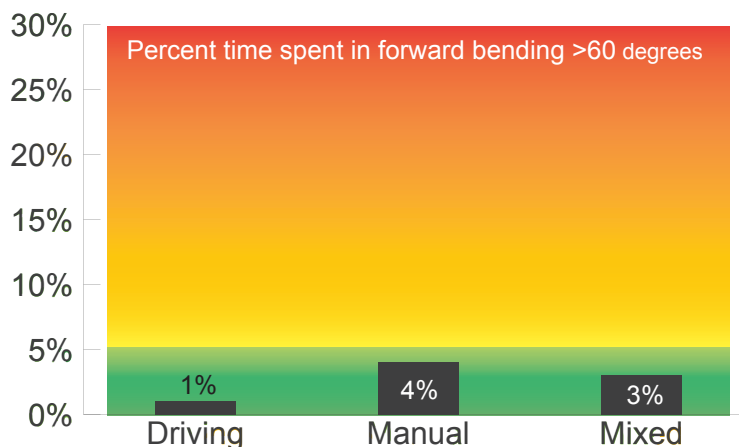
Using electronic data-loggers mounted on the chest, we measured 91 days of farm work on 49 different farmers. We separated these days into categories: 46 driving days (operating tractor, combine, sprayer, etc), 33 manual days (animal care tasks, machinery or building maintenance, etc) and 11 mixed task days (including driving and manual tasks).

What did we find?

Forward bending posture angle was measured in degrees (°)



Spending more than 33% of the time forward bending more than 20° (shown as a 'orange to red zone' in graph 1) may increase risk of back pain.



Spending more than 5% of the time forward bending more than 60° (shown as a 'orange to red zone' in graph 2) may increase risk of back pain.

What does this mean for your back?

- Manual tasks involve more forward bending than driving tasks.
- Driving usually doesn't involve much forward bending, but sitting for an extended period and vibration may still increase your risk of back pain.

Manual Handling

What is manual handling?

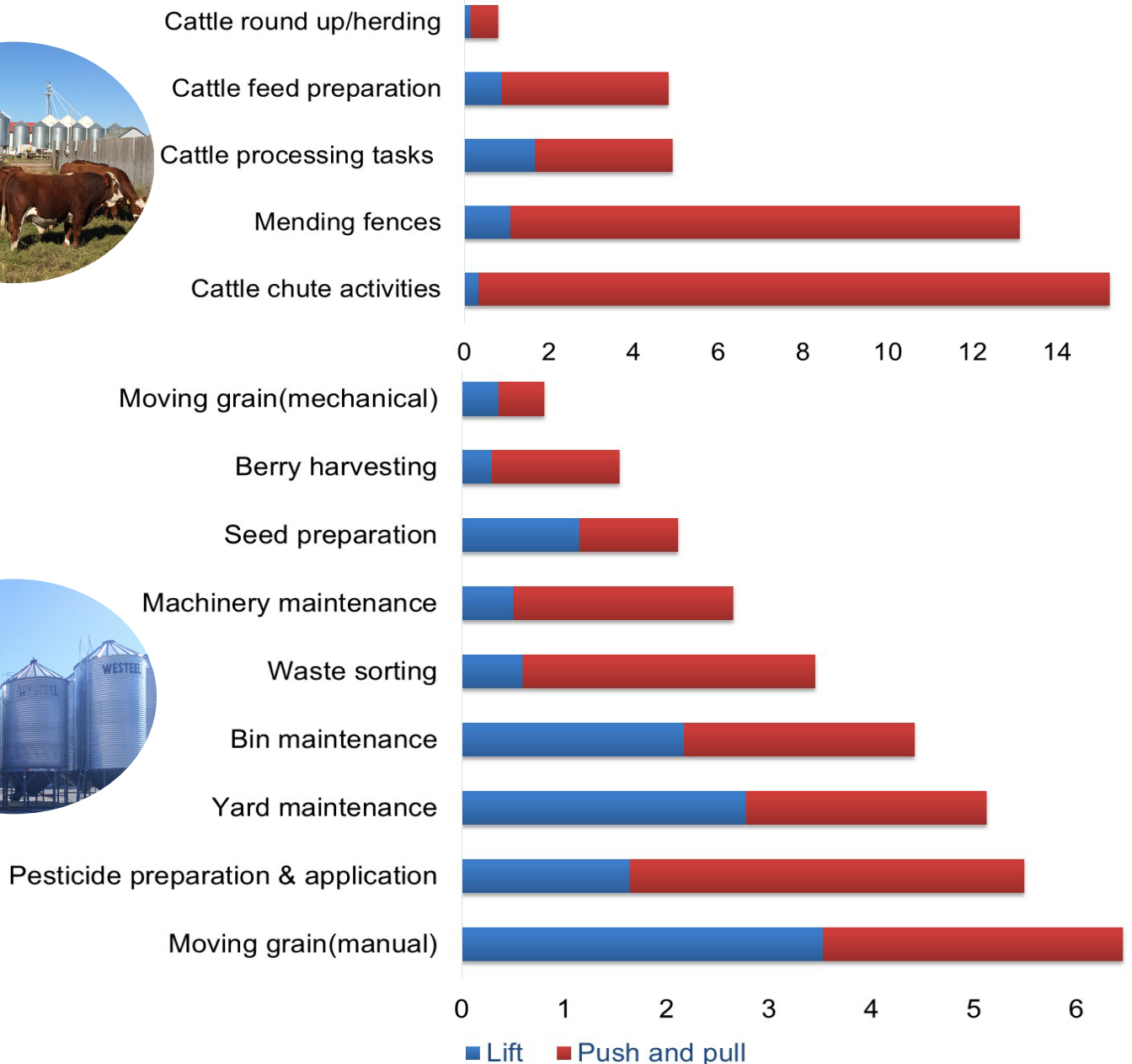
Manual handling is pushing, pulling, lifting, carrying with your hands. If combined with awkward postures and high force, it can increase your risk of back pain.

What did we measure?

We recorded videos during selected farm tasks, then measured the frequency of manual handling in selected grain and animal farm tasks.

What did we find?

Manual Handling is measured in units of “times per minute” or “frequency”. In this graph, **blue bars** are the frequency of **lifting**, **red bars** are the frequency of **pushing and pulling**. The total bar length is the total frequency of **lifting, pushing, and pulling**.



Staying Healthy on the Farm

For machinery whole body vibration

- Try to limit your daily time spent on a single piece of machinery, especially high-vibration ones like skid steers and ATVs.
- Take frequent breaks to stand up, stretch your back and legs, and walk.
- Use cushions or lumbar supports to support the curve of your lower back.
- Idling still produces vibration. If you aren't going anywhere, consider standing up and walking or gentle moving to stretch out your muscles.
- When equipment upgrades are an option, consider seats with air-ride suspension.

For machinery noise

- Try to limit your daily time spent on a single piece of machinery, especially ones without a cab protection.
- Try to avoid standing around an idling equipment.
- Wear hearing protectors such as earplugs or earmuffs.

For awkward posture

- During maintenance or animal care, avoid bending forward for too long, take breaks to straighten up and rest your back.
- Take breaks from driving to stand up and move your back.
- Do you twist to see your implements? Take micro-breaks to straighten out frequently and counter-twist in the other direction.

For manual handling

- Schedule your activities so that you can get help with big lifts or awkward tasks.
- Some tasks happen infrequently. Help your body be ready by staying fit and active throughout the year, and warming up before strenuous activity.
- When equipment upgrades are an option, consider hopper-bottom bins, wheeled carts, and machine lifting.

Thank You!

We gratefully acknowledge the generous participation of the farmers and farms involved in the study!

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