

Ergonomic Friendly Farming



MAINE
 AgrAbility

With Maine AgrAbility Specialists
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Brie Weisman, ORT/L

- 16 Years Occupational Therapist
- 19 Years Small Scale Hoop House Grower
- 15 Years Shepherd
- 6 Years Maine AgrAbility staff



Bella Russo, RYT-200

- 9 years farming diversified small scale farms
- 6 years BS Biology Plant pathology
- 5 years certified yoga instructor
- 1 year Maine AgrAbility staff

Ergonomics Defined

Adapting the environment with tools and techniques to support individuals through promoting good posture and neutral body positions on the job to reduce injury and increase productivity.

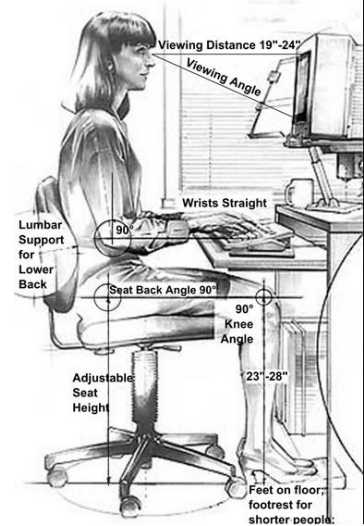
Office ergonomics exploded due to home office injuries during the pandemic.



- Adjustable office chairs
- Adjustable sit<->stand desks
- Ergonomic keyboards
- Computers on telescoping arm
- Promote mini-breaks

Farm ergonomics is slowly being addressed.

- New farm equipment more adjustable
- Smaller, lighter, long handled tools
- Slanted and higher surfaces
- Automation



Poor Ergonomics can lead to MSD



Musculoskeletal Disorders:
Injuries and disorders that affect movement or the musculoskeletal system.

- Medial/lateral epicondylitis
- CTS
- Thoracic Outlet syndrome
- DJD
- Herniated discs
- Rotator cuff injuries
- ACL tear
- And more

Poor Ergonomics

Primarily due to Five factors:

Posture

Duration

Repetition

Force

Environment

Awkward Postures

Include bending, twisting, reaching in order to get tasks completed.



Duration of Activity

Make hay while the sun shines.



Spread fertilizer before rain.



Repetitive motion

A dozen sheep x 4 feet=48 hooves to trim.



Force Required

The amount of exertion needed to perform a task: lifting, pushing and pulling.



Environment

How temperature, humidity, lighting, noise and air quality can affect farmers.



Addressing ergonomic issues through AE.

Low technology equipment	High technology equipment
Sheep/goat chair	Tilt table
Power wheelbarrow	ATV hauler/Tractor
Wheeled garden seat	Horizontal planting device
Step stool for tractor access	Built in additional step/grab bar
Back up mirrors, especially for tractor work	Back up video camera for tractor work
Plug in water heater	Automatic waterer

<http://www.agrability.org/toolbox/>

Low Tech Adaptive Tools

Sling hammock



Livestock chair



High technology adaptations

Battery hoof Trimmer

Livestock Tilt Table



Sometimes AE does not work

- Cost prohibitive
- Space limitations
- Time it takes to acquire it/limited availability
- New product does not fit old machine
- Does not solve the issue?
- Creates other issues
- Still requires additional adjustments

Addressing ergonomics through adaptive technique

The human body is still our most valuable tool.

Using it properly and respecting its limits and maintenance needs is paramount. It's more important than you most used tractor or equipment. Treat it as such!

Let's go back to the basics.



Basic Anatomy



Skeleton -is the load bearing part of the human body. Like the tractor frame.

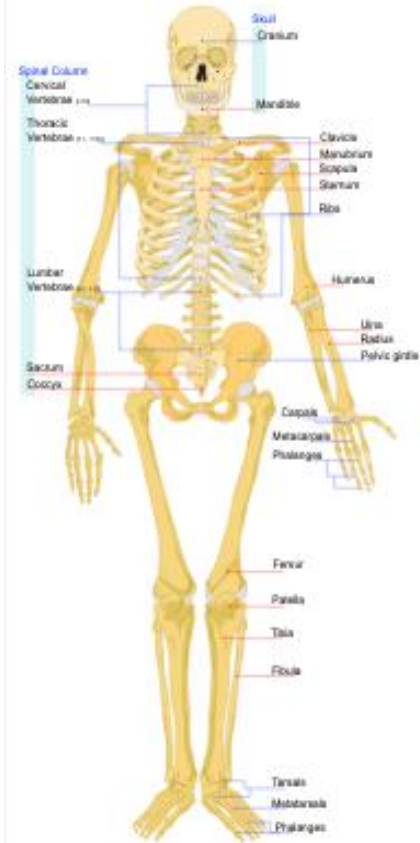
Muscles-The most abundant tissue in the human body, muscles produce force and motion. Like hydraulic cylinder.

Tendons-Connect muscles to bones via fibrous bands.

Ligaments-Connect bone to bone.

Nerves-Cordlike bundles of fibers through which stimuli and impulses pass.

Circulatory system-blood provides air, and nutrients to the body.

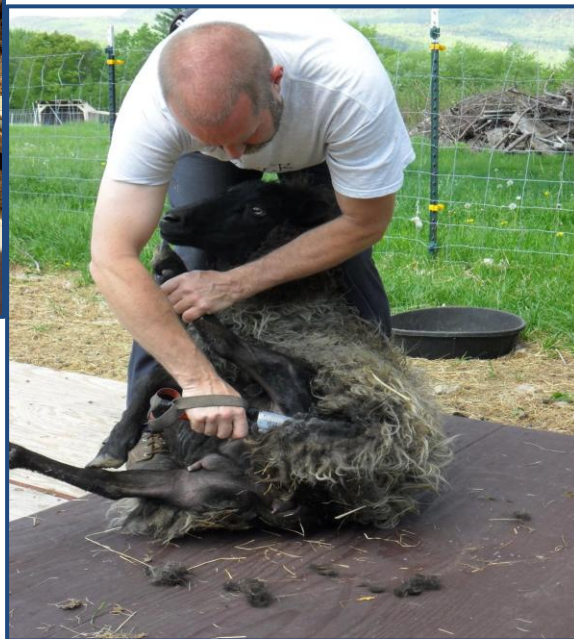


Adapting techniques with Shepherds



Jeff in traditional Sheep shearing stance.

Lloyd, crouching in order to shear.



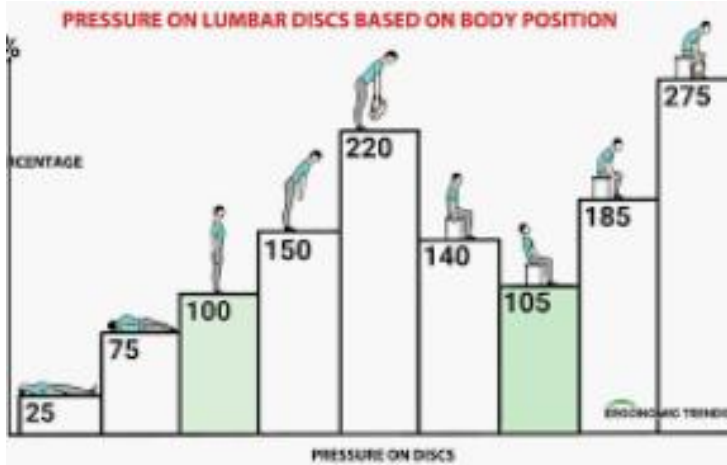
Jon kneeling to adjusted stance.



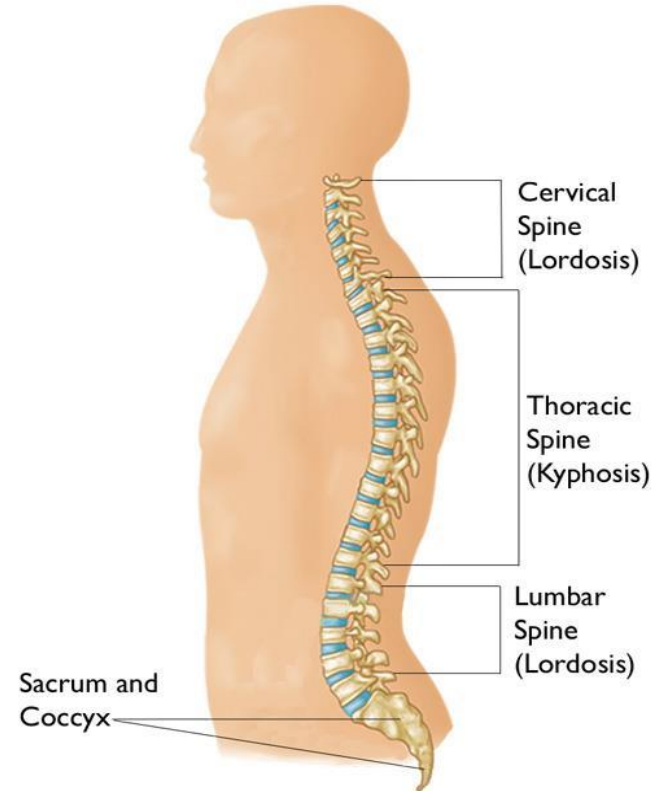
Posture is key

Respecting the 3 curves in your spine will lessen aches & pain in the back, neck, and shoulders. It reduces wear and tear on joints, especially the spine. It can reduce headaches and improve stability.

Compressive forces are always acting on our spine, poor posture increases the compressive forces increasing risk of injury.



<https://ergonomictrends.com/back-spine-pressure-chart/>

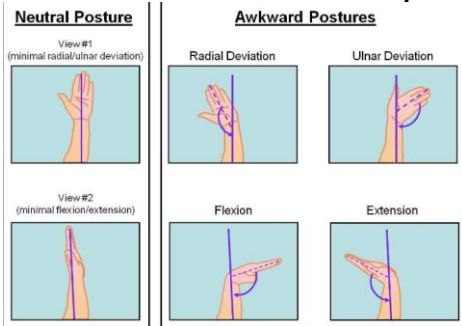


<https://orthoinfo.aaos.org/en/diseases--conditions/spine-basics/>

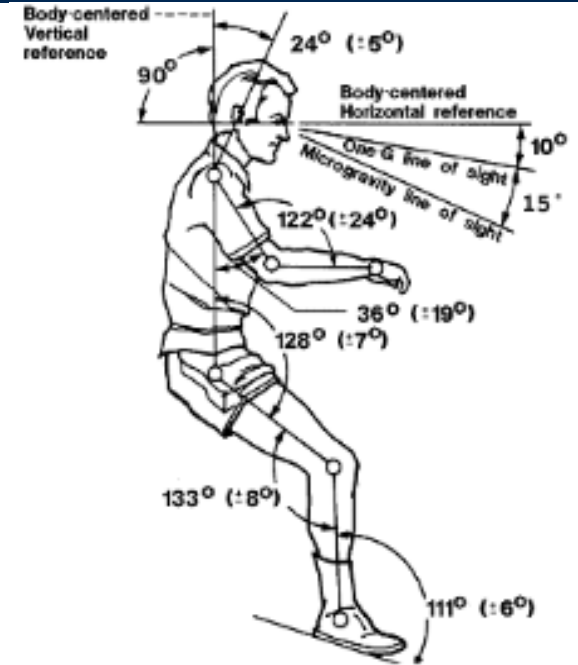
Neutral positions reduce MSD.

Beyond the reduction in risk of injury, a neutral posture also improves:

- blood flow to the brain,
- lung expansion,
- balance, energy
- endurance.
- reduce risk of compression, strain or injuries



https://www.cdc.gov/niosh/media/pdfs/2011-191_demonsttaion-of-ergonomic-principles.pdf



NASA STD-3000

<https://ntrs.nasa.gov/api/citations/20190032496/downloads/20190032496.pdf>

Targeted movement breaks

- Farmers often don't have the luxury of movement like an office worker.
 - Less access to more ergonomic friendly machines.
 - Work in the unforgiving outdoors rather than controlled indoor environment.
 - May be in awkward positions for long periods of time.
- Yet, taking a break of 2-3 minutes every 20-30 minutes could improve:
 - overall general health,
 - mood,
 - cognitive thought,
 - productivity.

It seems counterintuitive that taking a movement break from farming will make you more productive, but studies consistently show that stretch breaks on this schedule improve overall productivity and reduce downtime.

No special equipment needed

- Targeted movement can be considered walking, stretching or yoga.
- No lycra or yoga mat is needed.
- It can be done wherever you are: barn, field, hoop house, truck or tractor.
- In its simplest form it is doing the opposite of the movement you are performing:
For example, tractor drivers tend to be hunched forward, shoulders rolled inwards, leaning forward at hips.

The opposite posture would be putting a gentle arch in the lower back, pushing the shoulder blades back and down, and sticking out the chest.

You can use the machines and tools around you to assist with the stretching. For instance, using grab bars in the tractor to help accentuate a side bend, or use a long handled tool to help perform a twist.

The most important thing is not to rush or force the stretches.

YOGA STRETCHES FOR FARMERS

Your body is your most valuable tool — keep it in good working order.

Stretch for five minutes at a time throughout the day to reap the rewards. In the morning to prepare for the work ahead, during the day to pause and recharge, and before bed to relax for a good night's sleep.

While stretching be sure to pause and breathe fully — in through the nose, out through the nose or mouth. A breath cycle is an inhale and an exhale. Inhaling, feel your lungs expand, your spine lengthen, and the crown of your head lift. Exhaling, continue to sit or stand tall, slowly expel the breath completely through the mouth or nose. Repeat 2X, 10X anywhere, anytime.



COW POSE

Inhaling, fill the lungs. Lift the chest and feel the spine extend. Look up. Hold for 2–3 breaths.



CAT POSE

Exhaling, tuck the chin into the chest and slowly round the back. Hold for 2–3 breaths.



SEATED TWIST

Inhaling, sit tall, with weight evenly distributed on the sitz bones. Place right hand against outside of left knee. Exhaling, slowly turn torso and head to the left. Look toward your left shoulder, or in the direction of the left shoulder. Hold for 2–3 breaths. Repeat on opposite side.



SIDE BEND

Inhaling, sit tall. Bring right hand up above head. Exhaling, stretch hand over head and arc body to the left. Feel the stretch in the right side of body. Look straight ahead or up toward hand. Do not collapse into the left side. Breathe deeply and hold. Repeat on opposite side.



STANDING TWIST

Step right foot on a chair or other prop at 12" to 18" high. Feet are a comfortable distance apart. Place left hand on outside of right knee. Raise right hand out to side at shoulder height. Inhale, lengthen spine. Exhale, turn head and torso to the right. Hold for 2–3 breaths. Stand a bit taller with each inhale. Repeat on opposite side.



STANDING TWIST WITH LONG HANDLED TOOL

With feet hip distance apart, rest a tool lightly on shoulders. Hold tool with arms extended. Inhale, lengthen spine. Exhale, turn torso and head to the right. Hold for 2–3 breaths. Inhale, return to center. Repeat on opposite side.



WARRIOR POSE

Hold onto a support with right hand. Step left foot back about three feet, turn foot about 45 degrees left. Bend right knee and align directly over ankle. Keep left leg straight. With equal weight on both feet, reach hands skyward. Take a few deep breaths. Repeat with right foot back.



HALF DOWN DOG

Place hands on a prop or wall at waist height. Inhale, step both feet back. Exhale, bend from the hip, pushing away from the wall to lengthen spine. Arms are extended in front of you at shoulder height. With head between arms, look downward. Keep knees slightly bent. Hold for 2–3 breaths.

Photos: Courtesy Eric Wetman



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Questions



Resources Citations 1

SIMPLE SOLUTIONS: ERGONOMICS FOR FARM WORKERS

February 2001

Edited By: Sherry Baron¹, Cheryl F. Estill², Andrea Steege¹, Nina Lalich¹

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service, Centers for Disease Control and Prevention

National Institute for Occupational Safety and Health

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<https://www.cdc.gov/niosh/docs/2001-111/pdfs/2001-111.pdf> June 2020

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Resources Citations slide 2

Spinal curves

[Daniel K. Park, MD, FAAOS](#)

June 2020

February 27, 2025

Ortho Info

<https://orthoinfo.aaos.org/en/diseases--conditions/spine-basics/>

Back and Disc Pressure in Different Positions Chart

George Chiang

Image 2015

Ergonomic Trends

<https://ergonomictrends.com/back-spine-pressure-chart/>

Resource Citations slide 3

The [neutral body posture](#) (NBP) is the posture the human body naturally assumes in microgravity. The neutral body posture shown here was created from measurements of 12 people in the microgravity environment onboard Skylab.

Date 1987

Source <http://msis.jsc.nasa.gov/images/Section03/Image108.gif>

<http://msis.jsc.nasa.gov/sections/section03.htm#3.3.4%20Neutral%20Body%20Posture>

Author NASA

Other versions

replaces lower-resolution and poorer-quality version [File:Neutral body posture.jpg](#)

Practical Demonstrations of Ergonomic Principles

Susan M. Moore, Ph.D., Janet Torma-Krajewski, Ph.D., C.I.H., C.P.E.,

Lisa J. Steiner, M.S., C.P.E.

July 2011

CDC Department of Health and Human Services.

https://www.cdc.gov/niosh/media/pdfs/2011-191_demonsttaion-of-ergonomic-principles.pdf