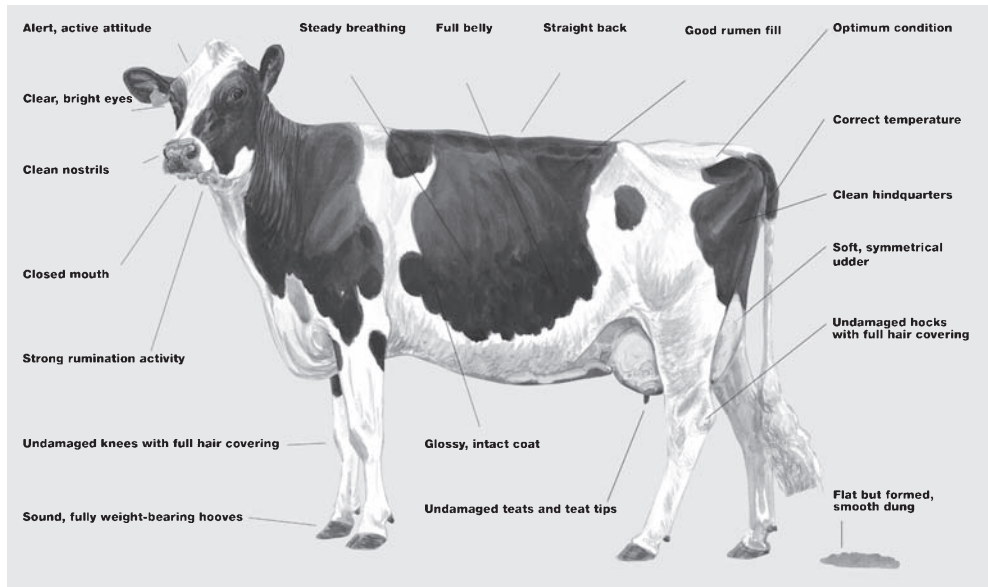


Appendix 2. Signals for assessing healthy and sick cows

Signals for healthy cows



Cow signals to assess health and welfare

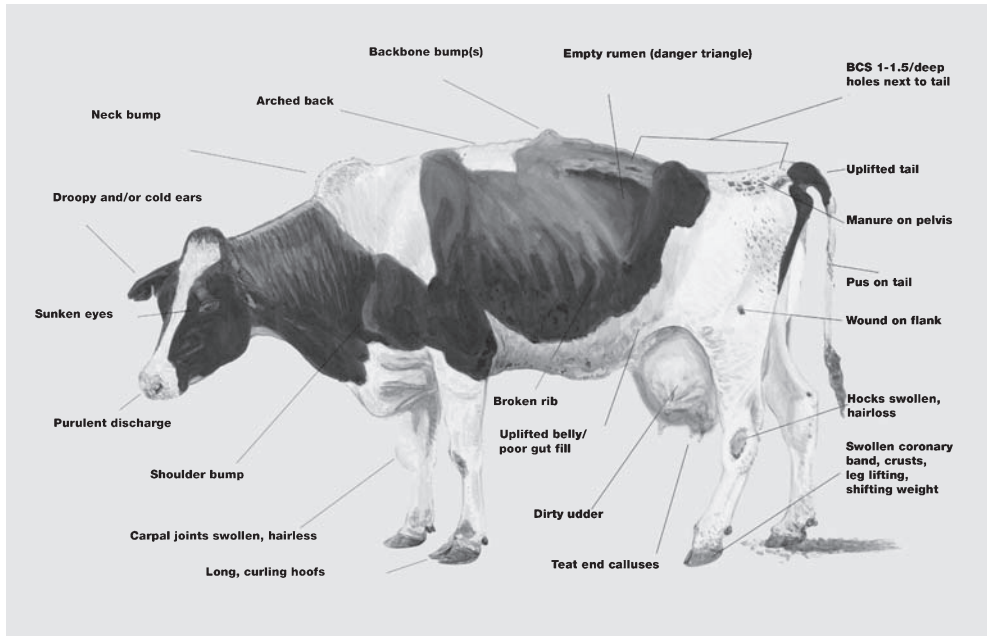
Cow's anatomy	Observation and interpretation
Whole body	Alert, active attitude Distracted attitude: indicates poor health, low energy status and possibly rumen acidosis
	Steady breathing Rapid and shallow: heat stress or pain. Sometimes at start of rumination period as well Normal: 10 to 30 times per minute
	Optimum condition Too thin: inadequate energy intake Too fat: excessive energy intake Normal: good flesh cover with a little fat
	Glossy intact coat Dull coat: poor health or nutrition Skin injuries: cause and result of agitation and reduced disease resistance
	Correct body temperature Too high (>39.0°C): fever Too low (<38.0°C): milk fever or serious illness Normal (between 38.0 and 38.5°C): healthy
Head	Clear, bright eyes Distracted attitude indicates poor health, low energy status and possibly rumen acidosis
	Clean nostrils Mucus with pus/blood and skin injuries: skin of the nose inflamed indicates virus or cold Clear mucus does not indicate much
	Closed mouth Some drooling: usually hunger Lot of drooling: swallowing problems or mouth pain Coughing: due to cold air, dust or disease
	Strong rumination activity Reduced chewing: diet lacks effective fibre Spitting out the cud: tooth problems, prickly bits in feed Normal: 55 to 75 chews per cud
Forequarters	Undamaged knees with full hair covering Bare knees: scraping on ground while getting up Swollen knees: bruising when getting up, lack of space in stall
	Sound, fully weight-bearing hooves Tiptoeing, standing on tips of hooves Injured or swollen coronary band Eczema or scabs in interdigital space
Abdomen	Full belly Belly too empty: hadn't eaten enough last week Take account of the size of the calf, if any
	Good rumen fill Too empty: hasn't eaten enough yesterday No discernible layered structure (apple shaped): not enough fibre in diet
	Straight back Arched back: painful hooves or physical wear and tear Injuries: usually bruising against stall partition

(Continued)

Cow signals to assess health and welfare (Continued)

Cow's anatomy	Observation and interpretation
Hindquarters	<p>Clean hindquarters Dung on both sides of rump: dung too thin Asymmetric soiling: environment too dirty</p>
	<p>Soft, systematic udder Hard: due to oedema around calving or mastitis (painful) Enlarged quarter: active mastitis Shrunken quarter: previous mastitis</p>
	<p>Undamaged teats and teat tips Trodden teats: too much agitation, stalls too narrow or too slippery Check milking machine and technique if you see calloused teat tips, swelling, redness or tiny blood spots</p>
	<p>Undamaged hocks with full hair covering Bare hocks: scraping on stall floor, lack of grip Thick hocks: lack of stall space, stall floor too hard Scabs: inflammation due to dirt or moisture</p>
	<p>Flat but formed, smooth dung Long stems: insufficient rumination activity Not too loose or too firm: always relate to ration components (e.g. grazed pastures) and lactation stage (dry v peak lactation) Use dung feedback to assess the diet: feeding methods, feed intake, digestion, water intake and health</p>

Signals for sick and distressed cows



Sickness and distress check list

Cow's anatomy	Observation and interpretation
Head	Sunken eyes: sick
	Droopy and/or cold ears: sick
	Purulent nasal discharge: rhinitis or chronic lung problem
Fore quarters	Neck bump: neck rail feed fence too low
	Shoulder bump: poorly designed feed fence/feed too far away
	Long curling hoofs: hoof trimming too late or not at all
	Carpal joints swollen, hairless: stall surface too hard, too little head space
Abdomen	Arched back: lame
	Backbone bumps: lying against stall divider
	Empty rumen: has eaten too little
	Broken rib: stall divider
	Uplifted belly/poor gut fill: pain/poor feed intake for days
Hind quarters	Body condition score of 1 to 1.5 and deep holes next to tail: long-term physical problems
	Dirty udder: dirty resting area and/or floors
	Teat end callouses: milking machine problems
	Uplifted tail: pain in birth canal
	Manure on pelvis: diarrhoea
	Pus on tail: endometritis
	Wound on flank: wet resting surfaces
	Swollen hocks and hair loss: stall surfaces too hard, abrasive or not enough grip
	Swollen coronary band, crusts, leg lifting, shifting weight: hoof diseases