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Reducing Weaning Stress In Two Easy Steps!

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The problem of weaning stress

Nothing is static, and so too our animal agriculture systems and management practices continue to evolve. One top candidate for change for some time now in beef production has been the way that we wean our cattle. Judging by their response (which lasts for several days!), it could well be the most stressful thing that we do to our animals.

There are several drawbacks to the common of "weaning on the truck" (separating cows and calves and sending the calves to auction). By this way of doing things, the negative effects of weaning stress are multiplied by transportation and handling stress, and by the stress of mixing and regrouping unfamiliar animals. As a result, a high proportion of newly weaned calves that were healthy and happy just days earlier, suddenly get sick and require treatment

Figure 1. An easily removable nose flap slid on the calf's septum prevents suckling.

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intervention to minimize associated losses. The leading preventative solution to this problem has been, the mass medication of all newly weaned calves with antibiotics (called metaphylaxis), to minimize the expected outbreak of illness. The negative public perceptions about the use of mass medication offer another important reason to consider alternative solutions.

One piece that I have been closely involved with over the last number of years has been trying to find ways to reduce the actual stress of the weaning itself. We all recognize that cows and their calves have a unique and close social bond. Dissolving that relationship requires quite a detailed understanding of the natural weaning process and the mechanisms involved.

The weaning two-step

To date, our best invention with respect to reducing weaning stress has been something called two-stage weaning, or as some fans of country music like to call it “the weaning two-step”! We discovered this quite by accident while exploring some very basic questions about the weaning process. I was curious about what all the fuss at weaning was *really* about. I was undecided whether calves were more upset by not having milk any more, or by missing the companionship of their mother. Normally when we wean, we remove both of these factors at the same time, making it impossible to know which is more important. The study that I designed to investigate this question gave rise to the weaning two-step.

We fitted calves with a nose-flap (Figure 1), which prevented them from nursing but still allowed them to graze and drink and have other forms of interaction with their mother. This allowed us to see what their response was when they were simply prevented from having any more milk. It turned out that there was almost no noticeable response at all, and things were very, very quiet. The calves gave-up trying to nurse within a couple of days. One thing we did notice though, was that calves spent their time quite close to their mother, which we suspected meant that the major fuss would come when the pairs were physically separated. But we were in for a big surprise!

Incredibly, after being physically separated, our two-step cows and calves were still extremely quiet. This was despite the fact that they were penned together with control animals that were being weaned by total separation and that were bawling and walking just like we expected them to. While it is true that cattle are herd animals, they have individual experiences and do not always act as one. Cows and calves that were weaned in two stages were clearly having a different and less stressful weaning experience and the calling, walking and commotion of the control animals did not seem to influence their response.

Just how much better is two-stage weaning? Well, compared with the traditional method of weaning by total separation (e.g., “weaning on the truck”), weaning in two stages reduced calling by calves by 95%. That means that for every 100 calls given by a calf weaned the traditional way, calves weaned in two stages call just 5 times. So this means a much quieter weaning experience for both you and your neighbours! Two-stage weaning reduced walking by calves by 60%, and increased the time they spent eating by 30%. So two-stage calves are wasting less energy searching for their mother and they are feeding more. We have shown that together, this results in two-stage calves gaining more weight in the first week following separation, compared to calves weaned by total separation. Cows weaned in two stages call 85% less and also spend 60% less time walking compared to cows weaned the traditional way.

All production advantages aside, we feel that another important plus of two-stage weaning is that taken all together, the evidence suggests that it improves the well-being of the animals, which is increasingly important in the evolution of animal agriculture practices.

Practical considerations

Our studies have shown that two-step calves respond the same way to physical separation whether they wear a nose-flap for 3 days or 14 days. We recommend that nose-flaps be left on for as little time as possible; 4-7 days. Don’t forget the second step of separating cows and calves.

Some people have expressed concern about the stress of handling, but this is probably the area of beef cattle production has evolved the most in recent years. Many producers now use the behavioral concepts flight zone and point of balance to handle their animals calmly and quietly. Low-stress handling is a natural partner for low-stress weaning.

If you have questions about the weaning two-step do not hesitate to contact Dr. Derek Haley a new Faculty member at the Ontario Veterinary College, University of Guelph at dhaley@uoguelph.ca or 519-824-4120, Ext. 53677.

Keeping Babies With Their Mommas Longer!

Suckler Calves prefer grazing stockpiled forage over creep feed

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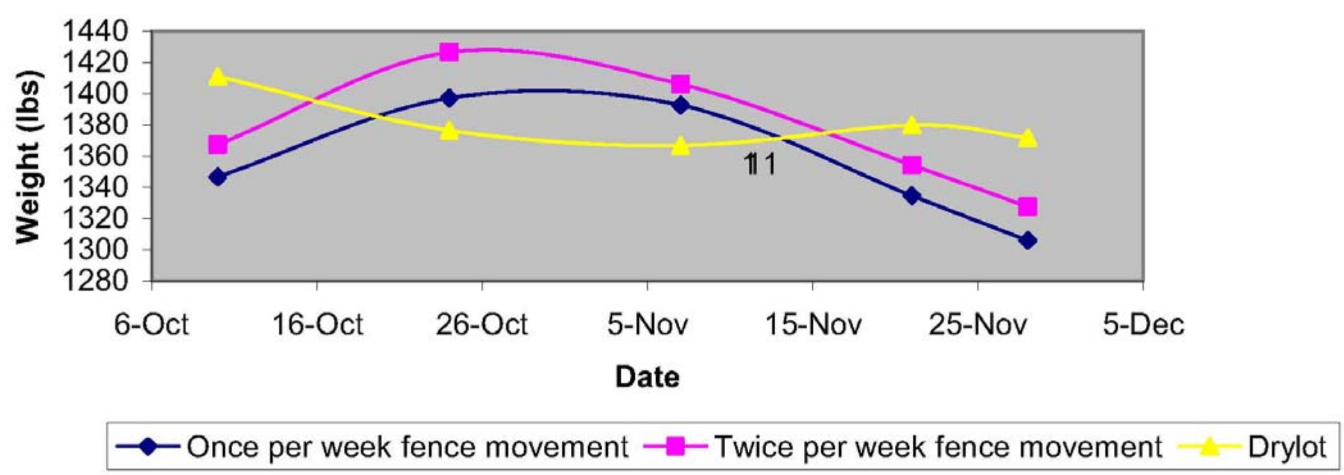
“OK, you talked me into this late spring/early summer calving thing. And it actually works really well. But I don’t know **what to do with** my **calves**. Do I wean them early and sell as light calves or do I leave them on the cow?”

I have had this conversation with a number of producers over the last couple of years, as many of them make the switch to calving later in the spring or into early summer, in May or June. The answer may well be to **leave them on the cows** until early winter before weaning.

Research at the New Liskeard Agricultural Research Station (NLARS) suggests that calves and cows grazing stockpile forages late into the fall will do very well, even compared to cows and creep-fed calves in a dry lot situation. For a number of years, researchers at NLARS have studied dry cows grazing **stockpiled grass**. Stockpiling is the process of allowing some pasture to grow for an extended period of time in late summer to accumulate for grazing in the late fall. The research showed that dry cows will meet their nutritional requirements and do very well on standing, stockpiled forage. But with the increase in spring/ summer calving, many producers were not weaning their calves until early winter. How would cow-calf pairs do on stockpile grass? A University of Guelph research team led by Dr. Ira Mandell[1] decided to use the summer calving cows in the NLARS beef herd to answer this question. They allocated 40 cow-calf pairs to fall grazing, with the balance of the 75 cows placed in a dry lot situation, with oatlage as the main cow feed source. Both sets of calves had free access to creep feed.

The stockpiled forage was 80 % grass (timothy, bluegrass, reed canary, orchard grass) and 20 % legume (trefoil, white Dutch and alsike clover.) The grazing cattle were given access to fresh pasture by moving the electric polywire either once per week or twice per week, depending on which sub-group they were in. The trial started in early October and ended in early December.
Previous research had shown that dry pregnant cows did well on stockpiled forage. But what about lactating cows? In this case, the lactating cows on pasture initially gained weight, and then gradually lost weight over the grazing period. The lactating cows in the barn initially lost weight while eating the oatlage, before gradually gaining weight for the rest of the trial. Overall, by the end of the trial (as seen in Figure 1), the cows from both groups performed the same. Both had lost a similar amount of body weight (approx. 3% of initial weight), and had also lost about 0.40 units of body condition score.

Figure 1: Effect of Management System on Cow Body Weights Over the Course of the Trial



The nutritional analysis of the oatlage compared to the pasture samples showed that the oatlage had less protein and more NDF and ADF fibre than the pasture, which may be one reason why cows on pasture initially gained weight. However, as the cold weather and snow came, the grazing cows did begin to lose weight. On five occasions the pasture grazing cows had to eat through more than 10

***Figure 2**. Cows and calves graze through snow in mid-November*

cms of snow. Previous studies have shown that snow depth can become a factor in forage consumption. Wind chill, night cooling and gradual decrease in pasture quality over time could also have contributed to declining weight of the pasture cows. However, by the end of the trial the groups of cows had experienced similar net weight change.

The conditions the pasture cattle were under in mid-November are illustrated in Figure 2. How did the **calves** fare? There was **no difference** in the **weight** of calves at the start and end of the trial between calves in the dry lot and calves on pasture. Surprisingly, **calf performance** was the **same** in the **barn or** on **pasture**, with average daily gain at about **2.40 lbs per day** per calf. However, the calves in the **dry lot** ate **much more creep feed** than the calves on stockpiled grass. The researchers suggested some potential reasons for this, including cow density limiting calves' access to stored forage feeders, boredom, or actual nutritional need. The increased consumption of creep by the calves may also help to explain why the cows in the dry lot gained weight in the latter part of the trial, as the calves reduced their nutritional drag on them.

By leaving the calves on the cows, and grazing pasture for as long as possible, significant savings in feed costs can be achieved. Figure 2 shows the cows and calves on pasture in mid-November. For example, the calves in the **barn** ate **183.4 lbs** of **creep** per **calf**, while the calves on twice weekly moving ate **36.0 lbs** and the calves on weekly movement ate only **14.1 lbs**. If creep feed is priced at $250 per tonne, then the calves in the barn each ate about **$21.00** worth of creep as compared to the twice per week calves at **$4.00**, and the weekly calves eating **$1.50** worth of creep for the duration of the trial. The pasture and oatlage costs were not assigned, however, pasture is generally considered to be much more economical than any type of machine harvested and stored forage.

Spring calving means that traditional sale times may not work for selling calves in the fall. The calves may be better sold in early winter or held until the following spring Beef producers looking to lower costs could find May/June calving combined with fall stockpile grazing and delayed weaning would provide both lowered feed costs and increased marketing opportunities.

For a detailed technical summary of this trial, go to: [*http://bru.aps.uoguelph.ca/Articles03/2003-pg57.pdf*](http://bru.aps.uoguelph.ca/Articles03/2003-pg57.pdf)

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What's Welfare to a Cow?

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We hear the term **animal welfare** bandied about in the press, but have you ever considered what welfare is **to a cow**? Recently at the International Beef Cattle Welfare Symposium, Dr. K.C. Olsen of Kansas State U tackled part of that question.

The cow calf industry hits the animal right's radar less frequently than many other agricultural systems. After all, on average the calves stay with their mothers and run **on grass** all **summer**. They fit the **idyllic vision** that many hold in their mind. However, if we look at the cow calf industry our welfare Issues probably fit into one of the following:

- Weather /Shelter
- Nutrition
- Management Practices
- Disease Prevention/Treatment
- Calving Difficulty/Dystocia
- Old/Injured and Cull Animals

Weather/Shelter is one many folks not familiar with cattle will think of as a necessity. In reality, given the choice, the **cow** will be **outside** most of the time. This is so even in the cold of winter as long as she has lots to eat, a good hair coat, and possibly a windbreak.

Nutrition is one we probably need to revisit more often, and question if our calving cycle is in synchrony with our nutrient cycle. Every year is different, and we pay attention in a drought year when the grass is short. However, do we pay attention to the slow subtle changes that happen to the herd over time? We have all heard it repeated many times that you fit the cow to the environment. And we probably did that15 years ago, or when we first started running cows. Or did we just get the cows that everybody else had without thinking about what our land produced? If we had the right amount of feed for the cows back then, what has changed? Many of us have cattle that have drifted up in size over the years. Much of the literature talks about 1200 lb cows, yet the average in Ontario is probably closer to 1500 lbs today. Also, over time we have bred for more milk in our cows – a good thing – as long as we changed the feed available as well.

If we increase the cow weight by 200 lbs, then nutrient requirements for maintenance increase by 20%. If we increase milking potential 10 lbs then nutrient requirements for maintenance increase by 20%.

Dr. Olsen noted we need to **match** the **cows** to the **resources** of the area. In North Dakota in a tough

Figure 1. *Cows with calves in a pasture setting represent an idyllic farm scenario.*

environment, CHAPS data (herd ROP) for 2008 showed cows that were 1200 and under weaned 617lbs, while the 1600+ cows weaned 434lbs. Clearly a case where the larger cows were exceeding the resource base, thus creating a nutrition, perhaps welfare, and definitely a financial issue.

Sometimes that resource/nutrition shortfall shows up in other ways. By selective breeding at the Kansas State University, the beef cows have gone from 1360 lb in 2005 to 1200 lbs in 2010. That is 60,000 lbs less body weight on the same resource base. They are now seeing greater cow **longevity** as a result of more resources available to the cows, even though they didn't think they were short-changing them before.

Management practices such as castration and dehorning are ones which always generate some controversy. These fall into the bad for good category. Some bad (pain, stress), is necessary for the overall or longer term good (unwanted breeding and horn injuries). **Pain mitigation** or nerve blockers are some of the technologies that will help us in this area of welfare as their application becomes more practical in the field and as new drugs become approved. In the meantime, the earlier in the calf's life we can do these tasks the less reaction there seems to be from the animal. **Vaccination** would be another example of bad for good - short term stress and pain being handled for the good of disease prevention.

Calving difficulty or dystocia is an area we all want to avoid, but how much thought do we really put toward it? This is a welfare problem that not only affects the cow but also the calf involved. It also can affect the welfare of the bottom line big time. Cows with hard calvings are slow to breed back, thus reducing your sale weight for next year. For the calf involved there is quite a multitude of possible welfare issues. In a hard calving the calf is more likely to be stillborn and have respiratory problems later in life and stands a greater subsequent chance of death. Much of this may be due to the stress of the hard birth impeding the from calf rising and nursing quickly, and this in turn impedes the calf's ability to get a good **passive immunity** transfer through the **colostrum**. Failure of passive immunity transfer meant that those calves would be 3x more likely to be treated in the feedlot for morbidity. Again, this is a welfare issue for the calf and the bottom line of the feedlot. Some of these welfare issues can be moderated by doing a good job PREPARING calves for weaning, unlike the current practices in the industry. Does the calf know how to eat and drink in a yard situation? Can you consider fence line or 2 stage weaning so the calf doesn't have to go through all the stressors of weaning in one fell swoop?

The final area where we owe cattle more welfare is in the **end of life** or use scenario. Make those decisions well before the animal is in bad shape. Can she walk freely and take the truck ride with no problems. If it is cancer eye move her out as soon as you realize it. It's better for her welfare and again for your bottom line, as you are less likely to have the carcass condemned. If the cow has reached a bad state step up to your responsibility and euthanize her. To quote Dr. Jan Shearer "better to euthanize a week too early than one day late." That will improve the cow's welfare, and the industry's welfare.

So stop and take a look at your farming practices and what the **welfare** issues may be through the **eyes** of your **cows** and through the eyes of your consumers. Are there things you need to consider changing? Luckily, many of those changes may also **improve** the welfare of your **bottom line**.

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Figure 1. *Collecting records is only the first step; to be truly useful, they need to be stored in an organized manner which allows rapid retrieval and analysis.*

A Day in the Life of a Beef Farmer

Scott Bothwell
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"Hey Martha, **when** did we **vaccinate** the calves last fall?"

"I'm not sure, John, I think it was the week before Thanksgiving, but now that I think about it, that may have been two years ago, now that I'm thinking about it" replies Martha.

"Oh, see I thought it was the end of October, 'cause I remember I had to take the truck in for service in the morning and I picked up vaccines on the way home. Oh well, I need to get vaccine again, I don't suppose you remember **what we used** then?"

A variant of this theme probably gets played out more times than we want to admit. Change the names or the roles, maybe it's a father-son operation, two or more brothers working together, or 3-4 families working together in an operation. How can you have a place to jot down **small details** like the day the calves were vaccinated or the vaccines that were used? What about the dates that the bulls were let out, and, maybe even more importantly, dates that the bulls were pulled out or switched around.

A common refrain that I hear these days is that many beef operations could use a 'part time secretary', "just to help with the desk work". While it cannot help with all the tasks that need to get jotted down or recorded, a computer with the right software can help. **BioTrack,** our **on-line** beef management **software**, allows you to capture pieces of information like those in our 'little dialogue' above. The benefit is that things like vaccination date and vaccination type are available for recall later that month, or even years later! You can search or reference your information from any computer connected to the internet, you are not tied to your farm office.

BioTrack is designed to capture the information that you want, on a customized basis. It is also designed to connect data on individual animals, across owners and from pedigree-to-cooler. It also connects to the **CCIA** (Canadian Cattle Identification Agency) database for things like age verification and to the **BIXS** (Beef InfoXchange System) database (for carcass data).

BioTrack also lets you:

- Keep health records (vaccinations and treatments) on both individual and group bases
- Make culling decisions using within-herd production indexes
- Make selection decisions using genetic evaluations, provided as across breed EPD's (expected progeny differences)
- Market your cattle with proven protocols of production
- Use evaluations of carcass data to make improvements in genetics and production practices to improve your business

Use the above pieces of information to make more effective business decisions
Nothing gets installed on your computer, so you don't have to be concerned about loading or updating software on your computer. And if your computer crashes, no problem, at least in terms of your BioTrack based information – it's safe and secure on our computer servers. Just grab another computer with internet access and you are "good to go". BioTrack editions are available for different herd sizes and levels of information. It's up to you to decide what you want to record. In essence, BioTrack offers an on-line record keeping system that offers you **flexibility**, convenience, simplicity and security.

Now let's go back and visit Martha and John... Martha insisted that John get BioTrack. John has just come in for supper and asks Martha, "When did we vaccinate the calves last fall?" Martha goes over to their laptop, pulls up the bookmarked BioTrack site, enters her user name and password and pulls up the vaccination records on the 2009 born calves. She replies "John, you and Bruce did them on the twenty-second of October, you did the 95 at the home farm in the morning and did the 35 at Bruce's in the afternoon; you used products X,Y and Z…." You get the idea.

If you would like to know more about **BioTrack** contact **Beef Improvement Opportunities** at 519-767-2665 x311, or x306. Website: www.biobeef.com

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Bossy Battles the Methane Monster

A cow learns the truth about livestock and global warming

Tom Hamilton
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Bossy the beef cow was laying down in the shade of the big maple, her favourite place to ruminate after her morning graze. Bossy felt good about her job, knowing that she was one of only a handful of animal species that could utilize tough, high **cellulose** plants like grass and corn stalks and use them in the creation of high **quality protein** that could help feed the world's ever-growing human population. She valued her alliance with the millions of microbes in her rumen which were the key to releasing the energy stored in plant fibre. And Bossy knew that her species' contributions were especially important in developing countries, where lack of animal protein in the diet was a major cause of sickness and disease for millions of people. Every once in a while, Bossy would let out a contented, virtually silent **burp**. It was **good** to be a **cow**!

But Bossy's contentment was suddenly shattered when her best friend, Daisy, settled in beside her and shared a newspaper article titled "*U.N. Blames Cows For Global Warming*". The story quoted from *"Livestock's Long Shadow"*[1] a report published by the Food and Agriculture Organization (FAO) of the United Nations, which stated that the livestock sector of agriculture was responsible for 18% of greenhouse gas (GHG) emissions, and that this was **greater than** that emitted by the **transportation** sector. The article went on to say that livestock are responsible for 37% of human related methane production, with most of that coming from the digestive tracts of ruminants. Bossy burped again, but this time it was an uncomfortable sensation. Suddenly, being a cow **didn't seem** to be such a **good** thing after all.

A week later, Bossy and Daisy again shared the same spot of shade. Bossy hadn't had a good night's sleep all week. She kept having nightmares haunted by the "Methane Monster" which kept pointing a grey gaseous finger at her. In her dreams, her burps were loud and everyone was staring at her accusingly. Bossy now looked gaunt, and her formerly shiny hair coat was rough. She had been actively scanning the media to learn more about cows' methane production and global warming. It seemed that everywhere she looked, the message was dire. **Cows** were being **blamed** as major contributors to global warming, with their methane production featured in everything from national news broadcasts to teen magazines. She even read about a European effort called "Less Meat = Less Heat", and something called "Meatless Mondays" in the US. Being a **cow** seemed more like being a **criminal** than an asset to the world.

Daisy, looking sleek and healthy, settled in and began reflectively chewing her cud. Bossy demanded to know how her friend could act so relaxed when they were being blamed for causing so much of the problem of global warming. Daisy explained that she found out a lot more about the facts since sharing the initial article. In particular, she read an interview with Dr. Frank Mitloehner, of the University of California at Davis[2]. Dr. Mitloehner, an air quality specialist stated that some of the statements in the executive summary of the FAO report were **not accurate**, in particular that the livestock sector is responsible for 18% of CO2e (CO2 equivalents, which

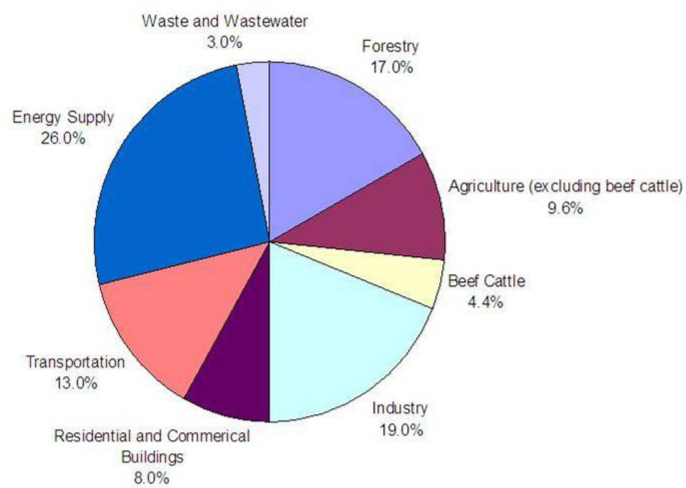

Figure 1. *Global Greenhouse Gas Emissions by Sector.*[3]

accounts for the different warming potency of various gases), and that this is a higher share than transport. Dr. Mitloehner pointed out that the FAO report generated a **total** for the livestock sector which included not only gases emitted by the animals themselves, but also by **growing** animal **feed** and **processing** the meat and milk into foods. And Mitloehner further stated that leading authorities agree that in the U.S., raising cattle and pigs for food accounts for about **3%** of all greenhouse emissions, while **transportation** creates an estimated **26%**.

Daisy was keen enough to read the whole FAO report herself, and found out that their "livestock" total for greenhouse gases also included those resulting from synthetic nitrogen **fertilizer production**, **deforestation** and **desertification** of land! Daisy and all of her livestock buddies were taking the blame for many factors outside of their control. In, fact, when Daisy did her cowgirl arithmetic using the FAO's own figures, she found out that when counting only the greenhouse gases actually produced by the animals themselves (from digestive processes and manure production), **beef cattle** accounted for only **4.4%** of human related GHG gas production. Things like burning coal, oil and natural gas to produce heat and electricity, and using gasoline and diesel to fuel cars and trucks were **much** greater factors in the total production of greenhouse gases. In fact, energy production, transportation, industry and forestry added up to **75%** of human caused GHG emissions.

Figure 2. *Bossy and Daisy talk over climate change. [photo credit: Robin Michetti Photography[4]]*

After this talk with Daisy, Bossy felt a lot better. She wasn't as embarrassed at the small burps she was letting out as her microbes digested fiber. She thought about the millions of acres of land in the world that was suitable only for growing forages, and the tonnes of left over crop residues which humans could not eat. She thought about the **1.3 billion** people employed worldwide in livestock industries, and the fact that many people in developing countries struggle to get **enough** high quality **animal protein** in their diets. She knew she would have a good sleep tonight. It was **great** to be a **cow**!

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[3] IPCC **Climate Change 2007: Synthesis Report Summary for Policymakers** http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf [image adapted by T. Hamilton]

[4] Robin Michetti Photography. http://www.robinmichetti.com/

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