THOMPSON AGRICULTURE ALTERNATIVES

2009 REPORT

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LIVESTOCK

Beef Cattle

A beef cow herd was started in 1974 when our children were in 4-H. Prior to this time, the silos and feeding yards were used to finish out purchased calves and yearlings. This high risk enterprise was ended and fences put back in so the cows and calves could be pastured and the financial risk lowered. The crossbred beef cows and their calves are a necessary part of this farm as they consume the hay and pasture that are needed for a sound rotation and furnish manure to put fertility back into the system.

The first cow herd was an Angus/Charolais cross, bred artificially to many different exotic bulls. The cow size increased when we kept females from these crosses. The meatiness and growing ability was excellent as some of the better steer calves were sold for 4-H projects. Some reproductive problems and the large appetite of the large cow caused this program to come to a close in 1985. Ten years of artificial insemination using different breeds has brought about the following observations. The medium sized British breeds, such as Angus, Shorthorn, and Hereford serve best as a maternal cross. The large sized breeds, such as Chianina, Charolais, and Limousin, are best used in a terminal cross.

The next cow herd was a Hereford/Angus cross purchased from the sandhills in Nebraska. These smaller cows were bred to exotic crossed bulls that we had raised from the first cow herd. The heifers from this cross were not kept cross because crossbred exotic cows have very large calves. As these Hereford/Angus cows became 10 and 11 years of age, there were too many open cows, so they were sold as pound cows. This program of having to buy a new set of cows every 5 to 7 years does not lend itself very well to improving the cow breeding program.

The next cow herd started by buying the first RX3 heifer calves in the fall of 1990. More calves were bought the next two seasons. The RX3 breed is a composite of 1/4 Red Holstein, 1/4 Hereford, and 1/2 Red Angus. The Red Holstein is used for growing ability and milking ability, the Hereford for ruggedness and durability, and the Red Angus for meatiness. RX3 bulls are used and the best heifers will be bred to expand the cow program. The unsatisfactory cows can be culled now since we have our own replacement heifers. All cows and calves are tagged, offspring are weighed at birth, weaning, and as a yearling. Hopefully this program is a balance of all desirable characteristics for the producer and the consumer.

RX3 Beef Cattle Records

Bull weights

Year	Birth weight	205 day weight	365 day weight
1992	92	656	1143
1993	94	599	1143

Weights adjusted (Age of Dam)

Figure 8-1

Intact Males

All the males are kept as bulls, and the top performance males will sold for breeding stock. The 1992 top performance bull had a birth weight of

Freezer Beef

Intact Males

Birth Date	Ear Tag	Age, Months	Dress Wt.	Live Wt.	Daily Gain	Birth Site
Aug. 16, 2001	82	17.8	844	1361	2.41	Grass
Sept. 26, 2001	83	16.4	1070	1726	3.36	Yard
Sept. 26, 2001	84	16.4	974	1571	3.04	Yard
Oct. 12, 2001	85	16.1	986	1590	3.18	Yard
Average		16.62	969	1562	3.01	

Intact male freezer beef

Figure 8-2

92 pounds, adjusted weaning weigh of 740 pounds, and yearling weight of 1262 pounds. The 1992 average weights for all bulls were 92, 656,and 1143 pounds **(Figure 8-1).** The 1992 birth weights are higher than desired with 47 percent assists at calving

The 1993 bulls averaged 94# at birth, 599# adjusted 205 day weights, and weighed 1143# adjusted 365 days **(Figure 8-1).** The number of assists at calving was 31 percent.

The 3 bull carcass weights in 1996 were 745, 812, and 845 pounds at 15 1/2 months of age. In 1997, the best bull carcass weighed 998 pounds at 14 months of age. These are sold to people for their home freezers. Three bulls were sold for herd sires.

Four 2001 fall bulls were left intact to slaughter and the results are shown in **Figure 8-2.** These bulls started very well as calves and 3 continued to gain over 3# per day. These 3 were born in the yard while the oldest bull was born on pasture and had the slowest growth rate. None of these cattle were treated for worms. **All males should be marketed in this way, but they don't need this heavy.** We had to wait a considerable time for a slaughter date. The sire of these four bulls was 5.5 frame size, thick and long with lots of meat on the inside. More information on Table 8-5.

Castration of bulls

In 1994 the remaining bulls were changed to steers on July 4th because bull carcass price was considerably lower than steer prices. It would be easier to put the bands on in early spring at 750 pounds. A EZE castrator is used to place a tight rubber cord around the testicle. The rubber cord must be pulled as tight as possible by hand first and then pulled very tight with the ratchet on the castrator. The testicle will drop off in 2 to 4 weeks. The EZE castrator can be purchased from Wadsworth Mfg. 889 Dublin Gulch Road, St. Ignatius, MT 59865. 1-800-535-2428 A tetanus shot should be given with castration at this age. We used tetanus antitoxin in 1995 with no problems but is higher cost. This shot produces immediate but temporary immunity that lasts for 7 to 14 days. Tetanus toxoid was used in 1996 and we lost one steer on July 17

Market Young Lean Bulls @ Steer Prices

Make use of natural male hormones - fast growing, efficient, lean animals. Bulls & heifers in separate pens.
U.S. markets discounts bulls.
Late castration @ 800# and sell as steers.
Late knife cutting too hard on animal & people.
Bloodless bands, less stress, but tetanus problems.
Applicator manufacture & veterinary supply catalog says one tetanus toxoid shot when applying band - lost 5 bulls out of 23 in 1999.
Vaccine manufacture says two tetanus toxoid shots, 1st shot 30 days prior to banding, 2nd shot at banding, full immunity 2 weeks later. This means handling the cattle twice.
Experimenting with sanitizing gloves, scrotum, band, and applicator with 7%H2O2 solution with and without tetanus vaccination.

mktbulls

Figure 8-3

from tetanus. The toxoid starts working at 14 days and lasts a long time. No problems with tetanus during 1997 or 1998 using the tetanus toxoid.

In 1999 one shot of tetanus toxoid was given as the bands were applied, within 12 days 5 of the 23 bulls showed symstoms of stiffness, buggy eyes, ears upright and lockjaw. These five animals had to be killed to put them out of their misery. Applicator manufacture and veterinary supply catalog recommends one tetanus toxoid shot when applying the band. Vaccine manufacture instructions say two tetanus toxoid shots, first shot 30 days prior to banding and second shot at banding time, full immunity follows two weeks after banding. These last instructions require handling the cattle twice and is probably why the **manufacture and vet supplier don't recommend the two shots (Figure 8-3).**

During 2000 we **did not use** any tetanus shots on 25 bulls, just sanitized gloves, scrotum, band and applicator with 7% H2O2 **(Figure 8-3).** We did this with great caution, castrating 2 or 3 bulls every two weeks from March 3 to July 15. No problems and will use this same slow procedure in 2001. **We do not recommend 7% H2O2 alone.**

During 2001 we lost one bull from tetanus about half way through this slow procedure. This bull died 12 days after he was banded. The rest of the bulls were given a tetanus antitoxin shot at banding.

The plans for future are a tetanus toxoid shot 30 days before banding and another shot at banding just like the vaccine manufacturer

recommends. We are not the only people having trouble with the one vaccination. Ken Wise, PFI board member, told his local veterinarian about our recommendation of two vaccinations. **The vet. said you need only one, so they banded 8 bulls with one vaccination and lost one bull with tetanus. We need to spend extra effort and do it right and play it safe. Handle the bulls twice, the easiest and quickest way is usually wrong.**

Cow Roughage Quailty

The quality of roughage during the winter of 93-94 was lowered by feeding 1/2 corn stalks to lower the protein content of the feed. Three pounds of ground ear corn and soybeans were fed per day. Apple cider vinegar was spread on the grain each day during the breeding season of 94 at the rate of 1 1/2 ounces per head. The number of calving assists was lowered to 5.3 percent in the spring 1994, 2.7 percent assist in 1995 and the calf puller was not used in 1996 **(Figure 8-4).** We feel the dramatic reduction in calving assists is due to feeding half hay and half cornstalks.

We started tub grinding two bales cornstalks and one bale poor first cutting hay that was stored outside during the wet summer of 1998. Tub grinding cost over $1800.00 that 98-99 winter. This mixture is picked up with loader bucket and dumped into a 150 foot hay feeder **(Figure 8-4b).** The 75 cows can all eat at the same time. This feeder was the old silage bunk. Roofing tin from the old cow

RX3 Beef Cattle Records

Prior 1994 all hay, after ½ hay and ½ cornstalks

Year	Birth Weight #	Calving Assists %	# Prolapses	# Cow Deaths
1992	94	47.4	1	1
1993	89	29.1	2	1
1994	85	5.3	1	0
1995	89	2.7	0	0
1996		0	1	1
1997		5.3	1	1
1998		4	0	0
1999		2.7	0	0
2000		1.3	0	0
2001		1.3	0	0
2002		2.7	0	0

RX3BCR2

Figure 8-4

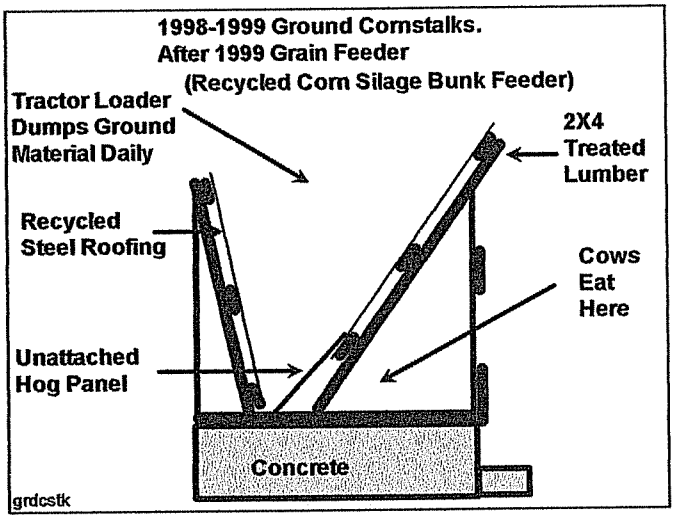


Figure 8-5

shed was recycled to make the hay feeder. There were no calving problems in 1998 from this ration.

Tub grinding was not used in 1999 because of the high cost and getting the tub grinder here when the wind velosity was low and from the right direction. Savings from not tub grinding are being used to build a steel arch building so that all hay can be stored inside. The bale feeder waste from feeding whole corn stalks bales is used to bed lots and sheds and then hauled to the manure bunker. The grain is now fed over the top of the 150' hay feeder **(Figure 8-5)** with the tractor loader. The loader bucket works easier than the garden cart.

Bt Corn

Farmers have had flat tires on combines, tractors, chisels plows from driving over Bt cornstubs while harvesting and after harvest. Some combines have bars under the cornhead to flatten the cornstubs to prevent tire damage. Farmers are complaining about damage to belts on belt balers and are interested in trying a baler that does not use belts to form the bale. Bt cornstubs goes through tires and belts, and this same plant keeps the corn borer from chewing holes in the cornstalk, what will this tougher stalk do in the cows mouth and stomach? Some Iowa research says cows grazing Bt and non Bt cornstalks perform the same. Other grazing studies say cows favor the non Bt corn-stalks. Our study will see what the cow says about Bt and non Bt cornstalk bales fed during the winter.

Two bushels of BT corn Pioneer 34M95 was purchased in 2002, our first experience with BT corn. The remainder of the field was planted to Pioneer 34M94, same breeding without BT. The reason for buying BT corn was to see if the cows had a preference. BT and Non BT stacked cornstalks were stored in different locations.

We put 6 bales of hay into two bale feeders on Monday morning and it last 3 days. We feed cornstalks daily for the next 4 days. Previously we feed all hay and the calves were to big.

BT cornstalks were fed in one bale feeder and Non BT was fed in the other feeder. In over 30 days of feeding comparisons the cows showed no preference. The cows liked both cornstalks and both feeders were cleaned up at the same time.

Both cornstalks were windowed with a 12 foot MC flail rotarty scythe and then stacked with a JD 100 flail stacker. The two flail operations improves the palitabilty of the cornstalks. The Bt cornstalks were wetter than Non Bt and needs more drying time between windrowing and stacking.

The stacker picked up more of the stalks out of the window increasing the stalk yield by 2000# per acre over using the baler. Using custom machinery rates, the stacker saves over $30 per acre compared to baling. Baling on ridges broke off many of the pickup teeth and we were always replacing teeth. If the stalks are too damp there will be more spoilage in the tight bale than in a stack.

2002 BT Corn Results
Over 20 bushel per acre yield advantage to BT corn, 194.5 (Pioneer 34M95) vs. 174.2 (Pioneer 34M94 non BT)
BT corn standing straight with on the leaves still on the stalk, a green stalk with a dry ear, less weeds. Fun to pick, picker snouts up and just drive. Non BT, same variety lodged early from wind damage. Does BT corn help with potassium uptake?
Green BT cornstalks have to be processed just like green hay. There needs to be some drying time between the flail rotary scythe windrower and the flail stacker. The rotary scythe rubs the wax off the plants which speeds up the drying process. The two flail processes cut and shred the stalks about like a tub grinder. This process makes good cow feed with less waste compared to baled cornstalks. Less mold in stacks compared to bales. Beef cows were fed the BT & Non BT cornstalks in separate bale feeders. Cows showed no preference.
BTCORN

Figure 8-6

BT Corn Verus Non GMO

Strip Comparisons

Year	Field #	BT Variety	NGMO Variety	BT Yields	NGMO Yields	BT Adv.
2002	3	34M95	34M94	196.42	170.04	26.38
2002	3	34M95	34M94	186.14	176.14	10
2003	2	33P67	34M94	194.28	182.65	11.63
2004	9	33P67	34M94	202.96	185.17	17.79
2004	1	33P67	34M94	216.84	187.85	29.89

Pioneer Varieties

Figure 8-6a

The Bt and Non Bt corn looked the same all summer until the wind came with a thunderstorm. The Bt stood straight while the Non Bt was leaning. At harvest the Bt leaves were still on the straight standing stalk while the Non Bt leaves and top of the stalk were on the ground. There was a difference in the ear corn picking, the snouts were raised up and the Bt green stalks went through the snapping rollers must better. Bt corn yield was 194.5 bushels per acre while Non Bt was 174.2 **(Figure 8-6). Figure 8-6a** shows more comparisons with an average of 19.14 bushels more per acre. Using the stacker instead of a baler, along with BT corn, increased cornstalks yield from 3,122 lbs. per acre to 5,513 **(Table 7-13).**

The past CEO of Fareway Stores called about buying BT ear corn to sell to people to feed the squirrels. This idea called for a test. What do squirrels prefer? Five pairs of BT (red cob) and NGMO (white cob) ears were selected. Three times the NGMO white cob ears were eaten first and two times the BT red cob ears were eaten first.

Cows were turned into Field 9 with BT and NGMO cornstalks in 2004. They were observed each day for 16 days and the cows were scattered over the entire field each day. The cows showed no preference between BT or NGMO cornstalks in the field.

Cows and Potassium

98-99 winter- cows thin, weak, went down and didn't get up - 8 died.
The mineral/vitamin mix had 250# NaCl, changed to 150# NaCl & 150# KCl plus free choice KCL. KCl does not meet organic certification. It took one year for cows to back off the free choice KCl.
99-2000 winter - cows health greatly impoved. Well water treated with 30 ppm H2O2.
Prior to 1995, potassium uptake problem in corn, corn plants weak, outside of leaf yellow, low ear leaf tissue test. Purchasing KCl fertilizer did not improve the bottom line. Moldbroad plowing once every 5 years improved corn yields 13 bu/acre.
Humans with leg weakness eat bananas and take potassium supplements.

cowspot

Figure 8-7

Cow Nutrition - Potassium

Beef cows were thin coming off pasture in 98 and were wormed with ivomec. During the 98-99 winter, the cows were on half hay and half cornstalks with 5# of ground ear corn per day and free choice mineral. Some cows were weak and went down and never got back up. The thinnest cows were sorted off and fed more grain. The cows were always hungry and not satisified. We lost 8 head before things turned around. We credit the turnover to the change in feeding minerals. Free choice pottasium chloride was made available to the cows along with a standard mineral mix for beef cows. Sometimes they consummed more straight KCl than the standard mineral. It has taken a year before they consummed more mix than straight KCl. Cows have not been wormed for the 99-00 winter. Cows are in much, much, much better condition in 99-00 winter. Three changes have been made during 1999, the addition of KCl to the cow ration, flex harrow pasture management of horn flies during the summer, and the well water is being treated with 30 ppm hydrogen peroxide since July 99. Tests on 3/17/00 detected very few parasitic worms in the cows or calves. Hydrogen peroxide did not control worms in the nursery and finish hogs.

Potassium shortage will cause weakness in cows as stated above and also weakness in corn plants and humans. We started taking potassium supplements in January 99 along with our other supplements. Adding potassium fertilizer did not improve our corn crop economicaly. Our glaciated soils tie up or fix potassium interfering with plant uptake. Moldbroad plowing once every 5 years improved corn yields 13 bushel per acre **(Figure 8-7).**

Calf Care

A nice bedded area was divided off by electric fence to allow passage of the calf under the wire while keeping the cow back. This system was used in 1992 and 1993. A very nice sleeping arrangement for the calf but not a good bonding method for the cow and calf. The bulls remain with the cows all the time except May1 to July 4. With the calving season spread out, there is less confusion about which calf belongs to which cow. We sell beef to consumers to put in their freezers and they want beef all year round. The 1995 calving season started March 28 and ended October 6, while the 1996 dates were February 15 to August 17. There was one open cow each year.

The calving season will start in May 2002 when the cows are on pasture. Previous years the bulls were turned out with the cows on July 4 but now it is August 1. Our yards are not large enough, the cows are too confined to be calving and it is hard to keep the yards clean with all of them confined.

Fattening Rations

The bulls/steers are fed 10% ground raw soybeans and 90% ground ear corn in a self feeder and hay free choice. The finishing rations for the heifers is 10% ground raw soybeans, 20% ground oats, and 70% ground ear corn placed in a self feeder. Hay and minerals are fed free choice. Dry molasses was added at 40# per ton when feeding Pioneer 3489 variety ground ear corn. Molasses atracted all the neighbors rats to the corn crib drive way.

Pioneer 3335 high energy variety has been grown in 98,99 and 2000. The above heifer ration with 3335 made the heifers yield grade 4's & 5 's while the 3489 variety heifer yield grade was 1's & 2's. The heifers now are being hand fed during the winter and go on the self feeder in the summer. The high energy corn fits very well with self feeding the bulls.

Diatomaceous Earth

An experiment was conducted to test the merits of Diatomaceous Earth as a wormer in beef cows. Fecal samples were taken from 15 cows after they had been wormed with ivomec and the results from this test are listed under the 1994 column **(Table 8-1).** DE was added at 10# per ton of ground ear corn and fed at 3# per head per day for one year. Fecal samples were taken again from the same cows one year later and the results are under column 1995. Dr. Gary Osweiler helped with the collections and processed the samples and his comments are at the bottom of the test sheet. The cows are in better condition in 1996 than they were in 1994. Four cows tested positive in 1995 and two of these cows were A 2 and A 93. These are the best cows in the herd.

DE should be used as a preventive maintance program. Cows that are thin and have diarrhea should be treated with ivomec or other products individually. DE should be in combination with other products and programs. **Cows came off pasture very thin in 1998, they were wormed with pour on ivomec. DE used as a wormer was discontinued in 1999.**

DE has been used in dust bags. Two bags are hanging in the walk through fly trap. The cattle will go under these bags at least four times a day when they are on pasture. One source for DE is Herman Tripp 2047-100th Street, Paton, IA 50217 515-968-4341

Intensive Grazing

Grazing unit days per acre (GUD)

Year	GUD per acre
1990	168
1991	222
1992	274
1993	158

Figure 8-8

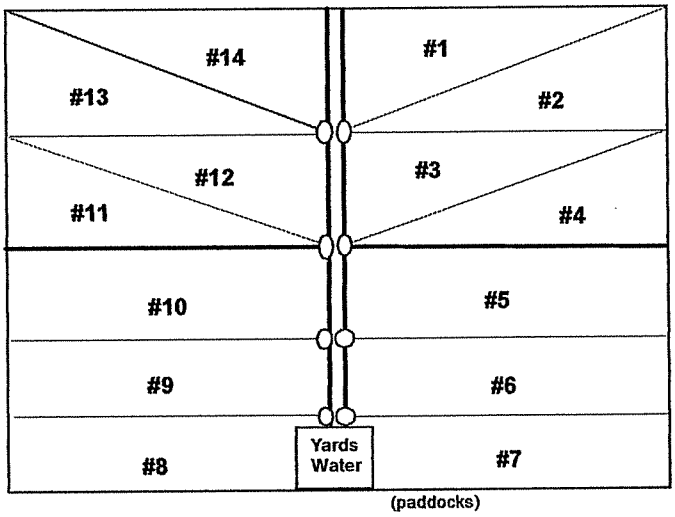


Figure 8-9

Intensive Grazing

Intensive grazing is one of the best technologies available to livestock producers. It is a means of lowering production costs and taking better care of the pasture. In 1990 our cow unit days per acre was 168 and it was increased to 222 in 1991 by adding more cows and increased to 274 in 1992 **(Figure 8-8).** In 1993 the grazing started sooner and the spring growth did not get ahead of the cows. The cattle numbers in 1993 were 75 cows and 3 bulls. The cattle were placed in the yards during the flooding periods in 1993. The center lane shown in **Figure 8-9** is a high ridge with a thin layer of 1 1/2 inch limestone with fines. This layer of rock with fines seals the top of ridge and the water runs off.

The four pastures are divided into fourteen paddocks of about 5 acres each in size. The fences around the outside of the pastures are permanent wood posts with 5 barbed wires and the center wire electrified. A center lane connects to all paddocks. A series of gates open or close to each paddock. Wood posts put in during the1940's are still standing while the posts placed in the ground during the 1970's are rotting. Posts that rot off are being replaced with used steel posts. A single electric polywire on fiberglass posts divides the pastures into paddocks, and this wire is not moved during the five years of grazing. To change the cows from one paddock to another, it is just a matter of closing one gate and opening another **(Figure 8-9).**

The cows let you know when it's time for a new paddock. They will be waiting in the lane for you to open a different gate into a new paddock of taller, greener forage. The forage should not be grazed too short or allowed to grow too tall. The best grazing height is about 8 to 12 inches and then grazed down to about 2 or 3 inches. We try to make the cows graze the forage tight enough so that the paddock does not need to be clipped mechanically. The grazing time should be about 3 to 4 days and the rest period 30 days. If you are going to increase the cow numbers to match early grazing, additional hay or extra warm season pastures will be needed for a dry summer.

Legume/grass Seeding Mix

In 1993, 2# Matua (easy drill) brome was added to the mix for field #7. We couldn't find the brome in the summer of 1994, 1995 or 1996. We need to find better varieties that over winter in Iowa.

In 1994, 2# Citadel perennial ryegrass and 1# Puna chickory was added to the mix for field #8. We have not been able to find the ryegrass. The chickory was noticable in the fall of 94. We were late in pasturing 1995 and the chickory grew very tall. The cows like the chickory except the large center stem. Very little chickory visable in 1996.

In 1999 (field #1)hay mix per acre was 4# alfalfa, 4# red clover, 4# orchard grass and 2# timothy. 2# birdsfoot trefoil, and 2# brome grass were added per acre for the pasture mix for field #7. The stands for both fields were excellent in the seeding year. The red clover did not over winter in the hay field #1 for the year 2001.

In 2001, (field #8) the hay mix was 3# alfalfa, 3# red clover, 5# orchardgrass. The pasture mix was 3# alfalfa, 2# birdsfoot trefoil, 1# Alice white clover, 1# alsike clover, 4# orchardgrass, 4# brome, 1# reeds canarygrass, 2.5# BG34 perennial ryegrass. Charles Brummer, ISU forage breeder, is going to watch this pasture to see which species do the best.

Reseeding Pastures

Acclaim red clover was frost seeded at 5# per acre in early March 1988 on field #6 and #8 pastures. A Herd seeder was mounted on the back of the John Deere Gator. This was a nice experience. Can't say this was a winner.

Broadcast 5# (Robust) red clover in north paddock field #6 and all of field #9 on March 24, 1999. Flex harrow on March 26, nice job.

Fall seeded field #9 with field #8 2001 pasture mix with Herd seeder mounted on JD Gator. Half lap with Flex Harrow before seeding. Didn't take!

The red clover that was seeded March 1999 disapeared in the field #7 pasture during 2000 and more red clover was frost seeded in 2001 but still no red clover. Broadcast brome, orchardgrass and alsike clover in late March 2003 on field #7. Half lap with Flex Harrow before seeding and after seeding turned the cows in to tramp in the seed. The cow tramping idea came from Jim Nelson at our 2002 field day. Stay tuned!

Size of Beef Cow Herd

The size of this cow herd is restricted in several different ways. Watching 75 cows calf in the spring is enough for Sharon and Dick. All 75 cows can eat grain at the same time at the old silage bunk feeder. The 40 acres of hay and 80 acres of baled cornstalks will feed and bed the livestock during the winter months. The paddocks will supply enough feed during the summer. These restrictions are good for the beef industry by trying to balance supply and demand with all the resources of labor and all the other inputs.

Cow Identification

All kinds of ear tags have been used to identify cows and calves from 1974 through 1997. All cows were tagged in both ears but still both tags would come out. All cattle have permanent tattoo in both ears. We discussed this problem during our 97 field day and it was suggested to freeze brand since we had all red cows. After reading articles about freeze branding and talking to farmers with good and bad experiences we purchased a For-Most tub, alley ways and cattle chute so we could handle the cows. We should have had this cattle handling corral and freeze branded the cows years ago.

Suggestions for freeze branding: clip the hair close on a flat area of the hip, brush the area clean, spray the area good with 99% alcohol and rock the branding iron, chilled by liquid nitrogen, back and forth for 20 seconds to 30 seconds depending on hide thickness. The above recommendations gave

us very little white hair with the branding time of 20 seconds. We have a scar brand that you can't read because of longer winter hair. The hair over the brand is clipped in the spring and remains readable until winter. One cow was branded for 18 seconds and has the scare but still no white hair.

Twenty one new heifers were freeze branded with liquid nitrogen in 2001. Each heifer received three brands, top brand at 25 seconds, middle brand at 20 seconds and the bottom brand at 15 seconds. All produced a scar but no white hair.

All cows and heifers were rebranded for the fourth try in 2002 with dry ice and 99% alcohol holding the cold iron on for one minute. This procedure should be better since dry ice is not as cold as liquid nitrogen. Hopefully it is not killing the hair but just changing the color to white. Stay tuned.

Spring 2003, the dry ice brands show up some better than liquid nitrogen, both brands were not readable in the middle of winter. Two sources say that freeze branding works better in the spring. My mentor who started me freeze branding is also having problems, he says sometimes it works and sometimes it don't. That makes me think about moon cycles, the internet was not of any help.

Using the advise from Virginia Moser, a biodynamic gardener, January 19, 2004 was the date selected for freeze branding 36 Red crossbred heifers. This date is in the last quarter moon phase and two days before a new moon. Dry ice with 99% alcohol was used, holding the irons on for 60 seconds. White numbers showed up good during the spring and summer but by winter the white hair seemed to disappear and some scaring begins to appear.

December 11, 2004 was the date selected for freeze branding 31 more Red crossbred heifers. Dry ice with 99% alcohol was used again, holding the irons on for less time (50 seconds). Does the width of the branding irons make a difference? Most of the heifers were branded with 5/8 inch width irons, but three heifers have both the 5/8 and 3/8 inch numbers. The number three was the thinner 3/8 inch iron. Stay tuned

Cattle Shed Remodling

All of our cattle sheds have the bump boards and manure planks on the out side of the building. It would be better to place these boards on the inside of posts for the following reasons. Manure would push the planks against the posts. Planks on the inside would keep the manure away from the posts. Cleaning would be much easier with a straight wall. The inside of the heifer shed was lined with four, 2 by 8 inch tongue & grove manure planks and two 2 by 6 inch bump boards. The boards were fastened with 40 penny nails that can be removed for repairing the posts. The cow shed was torn down and replaced with a 44 by 80 foot building. The 8 foot wood structure is setting on a 8 inch by 6 foot high concrete wall which is supported by a 8 by 42 inch below ground foundation. The wood-concrete shed was the same price as a pole building with inside manure planks. The cows enjoy the two to four foot bedding pack to lay on during the winter.

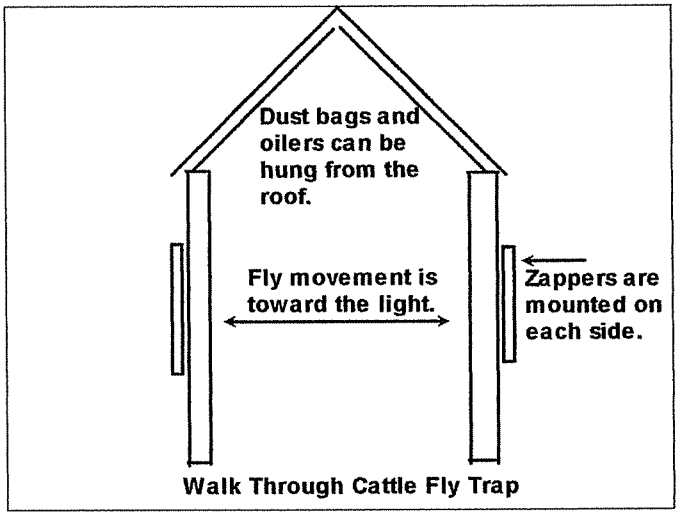


Figure 8-10

Flex Harrow for managing horn flies on beef cows, spreading cow droppings, and stimulating plant growth.

Each paddock was harrowed after cows were moved out. Harrowing was done 5 to 7 days after cows were put on this paddock. Horn fly eggs hatch in 10 days.
The paddock was double harrowed (same direction) by half-lapping going around paddock. Harrowing dries out manure and horn fly eggs die.

Observations

1999 was a wet spring and summer, producing a good hatch of horn flies. ISU entomologists receive many calls about horn fly problems.

Our cows had a very low number of horn flies on their backs in 1999. Past horn fly management of insecticides, fly traps and other products did not work.

flexhar1

Figure 8-11

Fly Trap Upgrade

The flat roof was removed from the walk through fly trap. A screen gable roof was covered with a arched skylight material and the flies will be trapped between the two roofs. Flies were not attracked to the skylight. The arched skylight roof did not withstand the winter winds and has been replaced with the second gable roof. A roof fly trap was in the gable roof but no flies were caught The Z type fly cages are on each side of the walk through. The oilers are hanging near the center of the walk through alley. They knock the flies off the cows back and are caught by the zapper or the screen traps. **Z screen walk through fly traps should be positioned north and south and in full sun light.** Our z screens were in the shadow of silos and set SE/NW. Very few flies were trapped between the screens. The z screens were removed in 2000 and replaced with two side mounted electric zappers, one on each side in the middle of the walk through alley. The zappers are to help manage stable flies. Two five gallon pail oilers with hanging mops have been under the gable roof **Figure 8-10** until 2003. The mops cost $48 to replace and are no longer available. The last $48 mop was wrecked by the herd bull two weeks after installation. A poly tube oiler covered by a beach towel has been placed just outside the walk through fly trap.

Flex Harrow & Fly Control

A 30 foot flex harrow was purchased in 1998 and mounted on an old soil conditioner frame. Recyling the soil conditioner saved $3000.00. Each paddock is harrowed after cows are moved out. Horn flies eggs hatch in 10 days so the harrowing is done about 7 days after the cows are turned in the paddock. The paddock is double harrowed, half lapping in the same direction going around the paddock. Harrowing dries out the manure causing the eggs and larve to die **(Figure 8-11).**

1999 was a wet spring and summer producing a good hatch of horn flies. ISU entomologists receive many calls about horn fly problems. **Our cows had a very low number of horn flies on their backs in 1999.** Past horn fly management of insecticides, z screen fly traps and other products have not worked. Using the flex harrow for horn flies and the electric zappers for stable flies looks like a nice combination. **Since 1998 very few horn have bothering the cows.**

Beef Cows, Worms & Flies (cowsw&f)
30' FlexHarrow half-lap, same direction after cows moved from paddock, 1998 through 2001, good control of horn flies. Jan 2002 cows ivomec pour on, bulls flies bad, brush on old oil, good results, $12 ivomec, poor fly control, good worm control. Did not flexharrow until Aug. 1,2002-hom flies bad, cows thin by fall, calves poor condition. Dec. 2002 safe guard in cow feed, before 6 bales hay two days, after 6 bales 3 days, calves ivomec pour on. Egg counts in fecal samples were low in 1994, 1995, 3-17-00, 12-21-00, 8-2001.
Conclusions: FECAL WORM EGG COUNTS ARE NOT RELIABLE FOR DETERMINING WORM INFESTATION IN BEEF COWS. Flex Harrow excellent tool for reducing build-up of horn flies & parasitic worms during pasture season. Cows should be wormed coming off pasture. How can H2O2 & D.E. & others be incorporated with the above? You can't let the flies, worms or weeds go!
Calving later on pasture in 2002 is much better than early calving in the yard. DAH! No more livestock show influence.

Figure 8-12

Flex Harrow & Parasitic Worms

The cows are still thinner than we would like. The cows were tested for worm eggs on 3/17/00 and 12/21/00 and detected very few worm eggs. Testing for worms eggs probably should be done during the "A" months (April and August). Maybe the worms do not shed eggs with the weather is cold. The cows look good on pasture but not so good in the winter.

Very soon after the cows leave a paddock, a 30 foot flex harrow half-laps going in the same direction to dry out the cow dropings. This has been the practice during 1998 through 2001 with very good horn fly control. Ivomec pour on was used on the cows during January 2002, should of been treated in September the fall before. Did not flex harrow in 2002 until August 1, the horn flies were bad, the late start did not reduce the horn flies. Horn flies were the worst on the two herd bulls, brushing on used oil kept the flies off but the treatment had to be repeated every few days. One bull would not stand still, so I treated with ivomec pour on ($12 worth for each bull). Ivomec did not keep the flies off. Cows were thin by fall and the calves were in poor condition. Safe Guard wormer was mixed in one days cow feed in December 2002, the cows were eating 6 bales in two days before worming after worming the 6 bales lasted an extra day. Worming should have

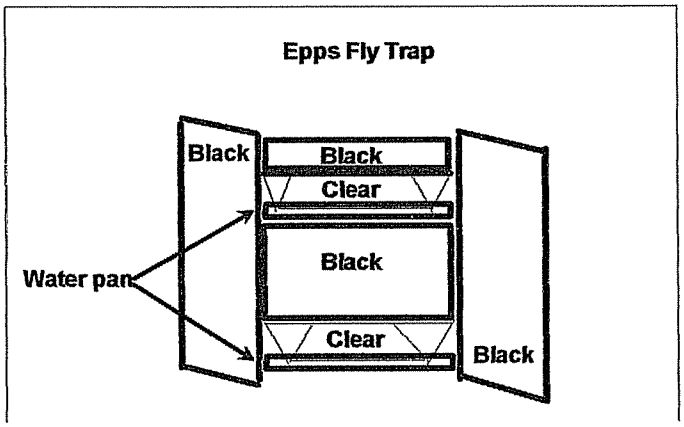


Figure 8-13

done when the cows and calves come off pasture the fall before. The bulls were in good flesh, so the $12 of ivomec helped with the internel worms. The calves that were in poor condition in the fall were treated with ivomec pour on in December and their condition is improving greatly . Egg counts in fecal samples were low in 1994,1995, 3/17/00, 12/21/00, 8/15/01.

Conclusions: FECAL WORM EGG COUNTS ARE NOT RELEABLE FOR DETERMINING WORM INTESTION IN BEEF CATTLE. The late start in flex harrowing in 2002 shows that this procedure is an excellent tool for reducing build up of horn flies and parasitic worms during the pasture season. Cows and calves should be wormed coming off pasture. Alternative methods can be included with pour on wormer and feed addidtive treatments. Fact: You can not let flies, worms, weeds go unchecked **(Figure 8-12).**

Conclusions: Worm calves and cows if they look tough, don't depend fecal worm egg counts.

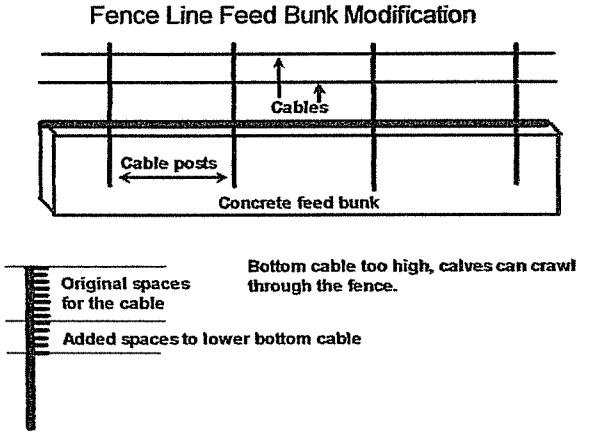


Figure 8-14

Don't pick the largest heifers for replacements. Don't pick the tallest herd bull with heaviest weaning and yearling weights.

Epps Fly Trap

The flex harrow has been very helpful in management of the horn fly on the cows in pasture. We need some help with the house and stable flies. We purchased a Epps fly trap in 2001 shown in **Figure 8-13.** The black canvas pieces of the fly trap are to attract the flies and the clear plastic pieces are fly through areas. The flies hit this diagonial clear plastic and fall into the pan of soapy water. The fly trap was placed near the bull/steer barn where the flies are the worst. This fly trap did not work on this farm, very few flies were in the soapy water, we never had to clean out any flies. The wind had torn apart the clear plastic and the black plastic is loose from the steel posts. Even if this principle worked, there is maintance problems of keeping soapy water in the pan and repairing the plastic.

Fence Line Bunks

One hundred forty four feet of fence line bunks have been added to limit feed heifers and cows. Heifers would get too fat for breeding or even too fat as market heifers on a self feeder of ground ear corn and free choice hay. A clean high volume loader bucket is used to dribble ground ear corn into these bunks. Bunks were purchased from Custom Precast at Cascade, IA 1-800-527-5596. The cable brackets had to be lower to keep calves from crawling into the bunks **(Figure 8-14).**

MiraFount Water Modification

Small calves could not reach the water through the original top cover. The top cover was removed and replaced by 3/4 inch plywood over the float area during warm weather. Now the calves could easily reach the water. This should have been done a long time ago. However this arrangement would freeze up during cold weather and the original cover was put back on during the winter. We had solved the problem only part of the time. The MiraFount was modified again in 2003 as shown in **Figure 8-15.** On extremely cold mornings a hole in the ice needs to be made so the cattle can drink. The cattle keep this hole open during the day. The float area stays ice free and now we have water access for small calves year round.

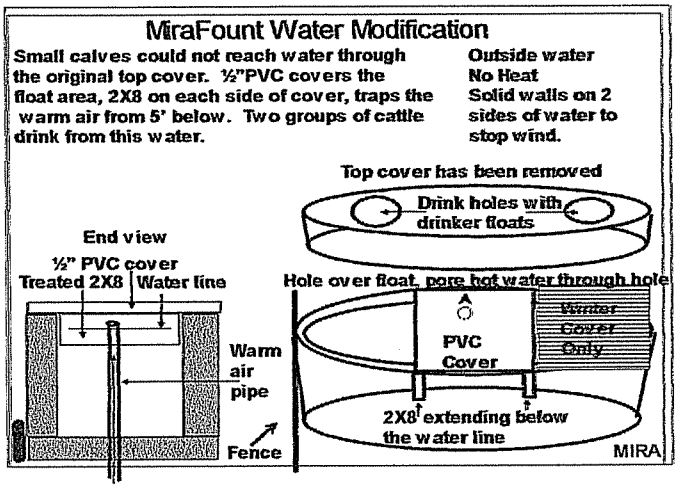


Figure 8-15

Oilers for Cattle

Many kinds of oilers have been tried on this farm. Most of them do not last very long, some only 3 months and were difficult to repair. We are interested in recycling used oil in the oilers. Cattle learn how to brush the flies off their backs with the oiler mop and the recycled oil on their backs keeps the flies away. Bull calves were injected with ivermectin January 1904. It did not control the lice and the bulls were really working the oiler in March. A cylinder tube with holes in the top works the best. The cattle roll the tube and oil comes out into a pad that covers the tube, and the pad is attached to a mop that dispences the oil on the cattle. A metal mesh screen goes around the outside of tube and pad for the cattle to scratch on. **The problem has been that the metal mesh screen breaks apart and a new screen is very hard to assemble with the pad and the mop.** The poly cylinders have lasted longer than the metal cylinders. Our next try is to repair the oiler while hanging from ceiling or attached to posts in the cattle yard. Buy a 34-36 inch width cotton or nylon beach towel that is 74 inches long. Center a folded 34 -36 inch width heavy beach towel over the tube. Center a 36 inch width canvas that is 30 inches in length over the towel. Attach canvas and towel with metal screws into top of tube, this is so that the towel, canvas and tube all turn together. Two metal straps are bolted together on the underside of tube with towel and canvas in between **(Figure 8-16).** Three of these homemade oilers were made in April 2002. One towel was replaced in April 2009, the other two oilers still going strong. When the cattle wear the towel out, take out the screws, put on a new towel or canvas if needed. Do this in place, do not take tube down. Attach canvas and towel with metal screws. Bolt the angle irons back to together with the canvas and towel in between. **Forget the metal mesh screen.**

The two oilers with large mops for the cows in the fly trap are no longer available. We purchased the last mop for $48.00 and the herd bull had it torn down in no time. Another poly tank with two beach towels has been hung outside the walk through fly trap.

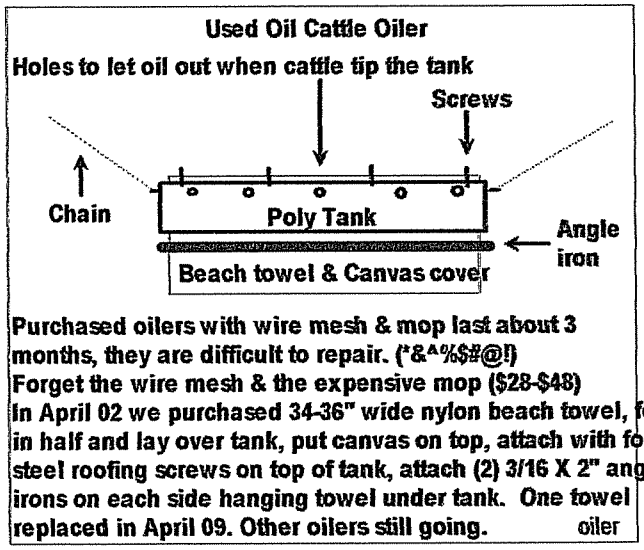


Figure 8-16

Self Feeder Filler Door

Closing the roof filler door has been a problem for some time. This was solved by adding a lip on the long handle to get inside the lid handle. More details are shown in **Figure 8-17.**

Cattle Corral

Some changes have been made in how the head gate and chute is used. We found that putting a cow in the head gate and removing the lower side panel for her new calf to nurse did not work. This opening is to low for the calf to get under and you have to stand of your head to try to help the calf nurse. Sharon suggested taking the cow out of the head gate, backing the cow to rear of the chute, next place a pipe across the chute to keep the cow back against the rear gate. Open the rear side examination door so

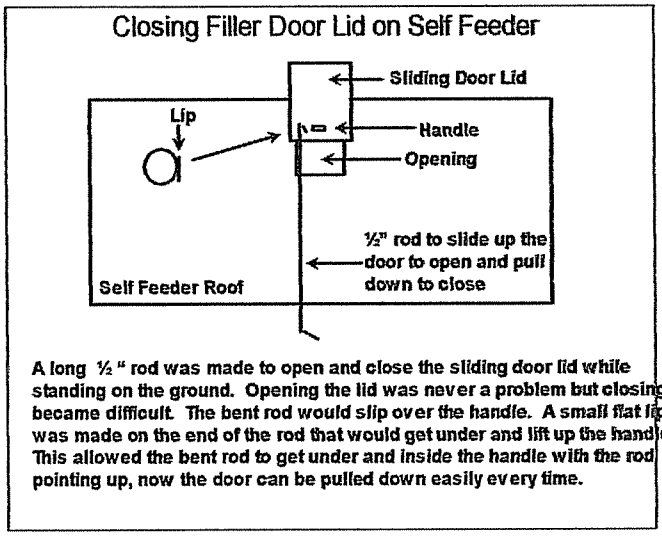


Figure 8-17

you can help the calf nurse. This was a great improvement when helping a new calf connect with mother. We now place a feed tub in the front part of the chute just behind the head gate. With feed in the tub the cow is more interested in eating than what's going on at the back end of the chute. We had used the feed tub idea in front of the head gate many times but this was the frist time behind the head gate **(Figure 8-18).**

Another improvement was welding a 1/4" X 2"rod on each side of a 3/8" threaded bolt and attach to the side of the chute. The 3/8" rope is pulled to raise the rear gate of the chute. A knot is made in the rope at the right place to hold the gate open. The 3/8" rope will pass between the welded on rods and

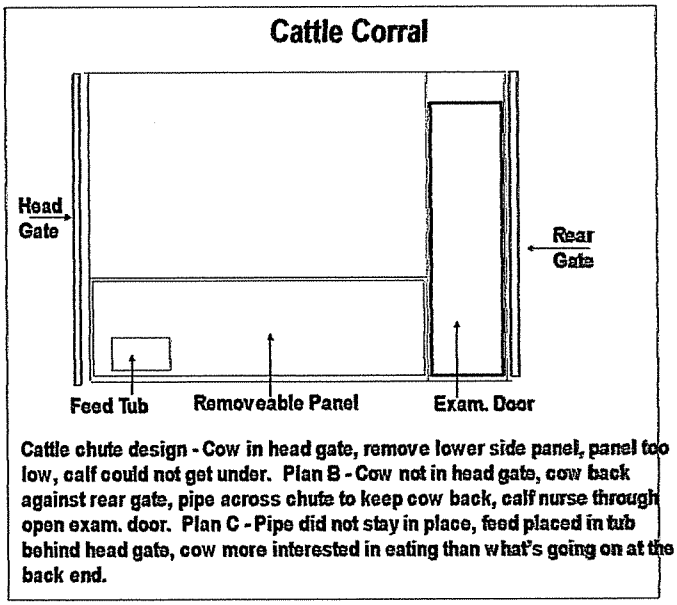


Figure 8-18

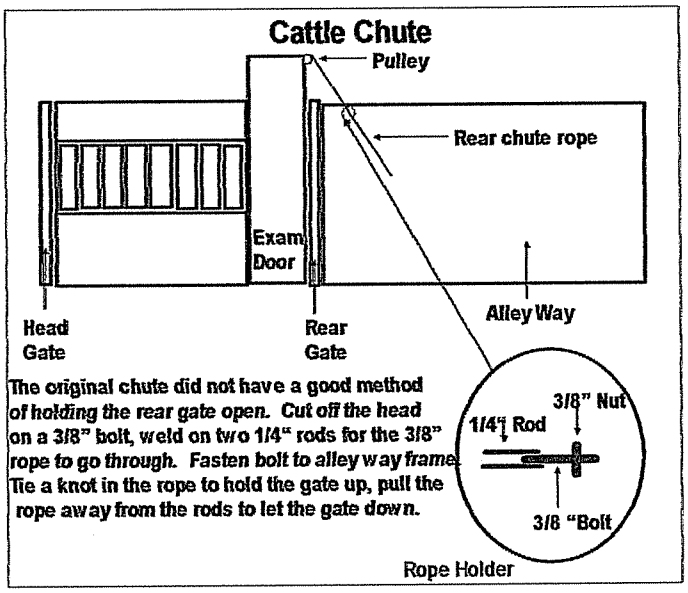


Figure 8-19

the knot will not. The knot is placed behind the two extended rods and the gate stays up, by pulling the rope out away from the open rods, the gate will come down **(Figure 8-19).**

Concrete Cattle Walls

Our cattle yard fences needed to be replaced. We were tried of fixing wooden or wire panels fences, we have been using a lot of concrete walls in the Cargill swine system. The new cattle fence is 54 inch tall free standing walls were purchased from Custom Precast at Cascade, IA 1-800-527-5596. The cost was $15.84 per foot delivered. The walls will last forever but if things change in future years these walls can be moved to other locations.

Flex Harrow

Oats, Legume/Grass Seeding

Our normal procedure was to disk the corn ridge twice in the spring, drill in the oats followed by drill press wheels, drop the legume/grass on top of the soil followed by drill scratchers. The soil was usually damp and the drill would push soil ahead of the drill. This operation was not a fun trip since the piles of dirt would have to be leveled out.

In the spring of 1999, pulling the 30' flex harrow crosswise over the spring disked ground solved the drill plugging problem. The soil is now drier, finer, and an excellent seed bed for the small legume/grass seeds. Seeding rate in 1999 was the same as previous years but there was stand improve-

Thompson Research & Demonstration Farm
One year observations on the Flex Harrow
Flex Harrow was used for Oats/Legume & Grass Estab.

Corn ridges disked level in fall, flex harrow crossways in spring, drill oats with legumes/grasses scattered on top, drill has scratcher attachment, 2nd flex harrowing optional.

Observations

When drill followed the disk, soil would not flow very well through disk openers, using the flex harrow solved this problem. The flex harrow itself has never plugged.

The flex harrow made an excellent seed bed, best stand of legumes & grasses ever, less weeds coming up through the oats, best stubble/hay yield ever, 4337#/A. (double the 11 year average).

flexhar

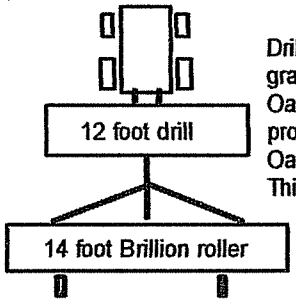
Figure 8-20

ment in 1999, best ever. Best ever stubble/hay yield, 4337 pounds per acre, double the 11 year average **(Figure 8-20).** This particular oat field has previous history of many sunflowers but in 1999 there were just a few sunflowers higher than the oats at harvest.

The hay yield in 2000 was 13,095 pounds per acre compared to Boone County yield of 6,200. In 2001 the hay yield was 14,188 pounds per acre, 2002 hay yield was 14,502 pounds per acre **(Table 5-4 in Chapter 5).** In 2002, a 14 foot Brillion pulverizer was attached behind the drill to press down the soil for better seed to soil contact for the oats, legumes, and grasses **(Figure 8-21).** The oats came up fast, oat yield was 116 bushels per acre and the straw yield was over 5000# per acre. Deeper tillage with the field cultivator and faster starting oats got ahead of the Canada thistles.

Drilling oats

Corn stalks, fall windrowed flail rotary scythe-flail JD stacker
Flag Canada thistle patches, Deep chisel Canada thistle patches by moon phase in Nov. and Dec.
Fall disk to level ridges and mix soil with residue.
Spring, field cultivate deep, thistle patches twice, by moon phase if possible



Drill in oats, broadcast legumes & grasses, with roller attached.
Oats come up fast, allelopathic properties
Oats harvested before Canada Thistle seeds are mature

(DRROLL)

Figure 8-21

Apple Cider Vinegar

We live in a high calcium area, some of the soils are alkali, the water has lots of calcium, there are calcium carbonate deposits close by. The ph of our water is 7.8. Should we add an acetic solution to our water to lower the ph? Farmers in Ontario, Canada have suppressed pig scours by adding apple cider vinegar to their water supply. Many books have been written about the wonders of the vinegar made from apples. Dick has used the vinegar/honey drink for over 30 years.

A second pump was added to meter apple cider vinegar into the water system at both farms. This has been discontinued for several reasons. The nipple waters for the hogs were plugging, The new one inch plastic line to the cow water has lost flowing capacity. The reverse omosis water treatment in the house became all fouled up, this problem was corrected by turning off the apple cider vinegar and turning the hydrogen peroxide back on. Apple cider vinegar is now being dribbled into the feed at the grinder/mixer. A hole was torched into the top of the conveyer, a short piece of pipe was welded in the hole and extends above the conveyer. Two cuts perpendicular to each other are made with a knife in the vinegar jug cap. A small piece is cut out with a knife, with experience you will determine how big to

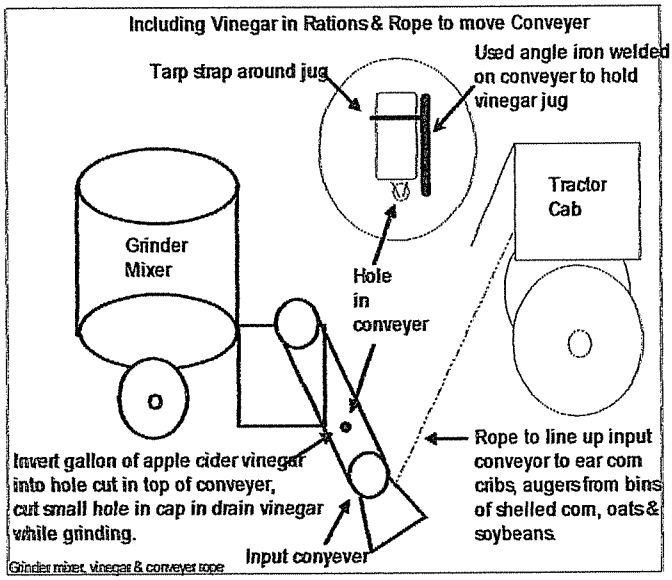


Figure 8-22

make the hole so the jug is empty when the grinder is full. Using the knife is much better than punching a hole in the cap. The top of the jug is placed inside the pipe **(Figure 8-22)**. One gallon ACV per 5000 pounds ground ear corn for cattle.

Rope on G/M Conveyer

This rope should have been put our grinders 100 years ago. Getting the conveyer parallel with the corncrib and at the right place is not easy without the rope. Sometimes the conveyer does not follow the grinder and you have to climb down and adjust the conveyer and climb back up. The rope needs to be long enough to reach the tractor cab when the conveyer is placed in transport position **(Figure 8-22)**.

Haying Equipment

Rotary Scythe

The twelve foot MC rotary scythe flail mower, purchased in 1991, puts the hay in a ten foot swath. Windrowing shields are put back on the rotary scythe to windrow 4 rows of cornstalks for baling in the fall. Each spring the flails are sharpened, in place on the machine, with a hand grinder. This machine has been used on 240 acres per year. Flails were replaced in 1998. This machine is simple with only 2 sprockets and short roller chain. We use only diesel fuel in a wick chain oiler when windrowing cornstalks, making sure the chain stays wet at all times. It is a delight to mow with this machine, all you do is drive, stop every hour to fill the wick oiler with diesel fuel. The 1991 machine was traded in the fall of 2003 for another 12 MC rotary scythe.

Wheel Rake

A Gehl wheel rake purchased in 1994 moves one or two ten foot swaths into a windrow about three to four hours before baling. This machine will windrow cornstalks on frozen ridges without breaking rake tines. A wheel rake is nice to operate but the only problem is wind when going all four directions around the field. The solution is to find the right direction with less wind interference and go back and forth across the field. The teeth were wearing thin and breaking off in 2004. The whole wheel was replaced with a Vermeer different style heavier tooth wheel. This wheel moves dirt and needs to be held up some, you can't run the hydraulic lever on float.

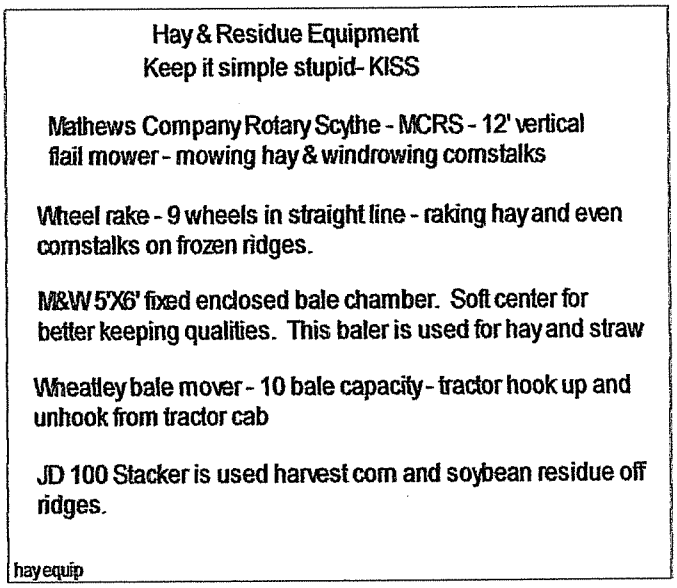


Figure 8-23

Hay Baler

Large round bales wrapped with nylon netting were used in 1992 and these outside stored bales were not feedable during the winter months. The nylon would not come off because of all the ice and snow on the outside of the bales. The nylon wrap was tried because the twine tie bales, when stored outside, would rot on the bottom and fall apart when picked up with the tractor loader bale probe. The tractor loader is now equipped with a pallet fork to pick up the twine wrapped bales that are stored outside. If there is some spoilage, the pallet fork can get under the twine and keep the bale intact. All hay was stored inside in 2000 with the addition of a metal quosant building.

We have tried very hard but could not make the weaving belt baler work on ridged cornstalks. The belted hard core baler was traded for a soft core, less complicated 1800 M&W 5X6 fixed chamber (completely enclosed) baler in 1993. The 1800 M&W baler produced droopy bales, had slip-clutch problems, and was traded for a 1710 Gehl 5X6 baler in 1994. The Gehl was a fixed drum chamber producing a soft-center bale. In 2000 the high maintance Gehl baler with three long roller chains, 20 sprockets, 40 drum stub shafts was traded for a simpler new style M&W baler **(Figure 8-23)**. The new 5600 M&W 5X6 fixed chamber (completely

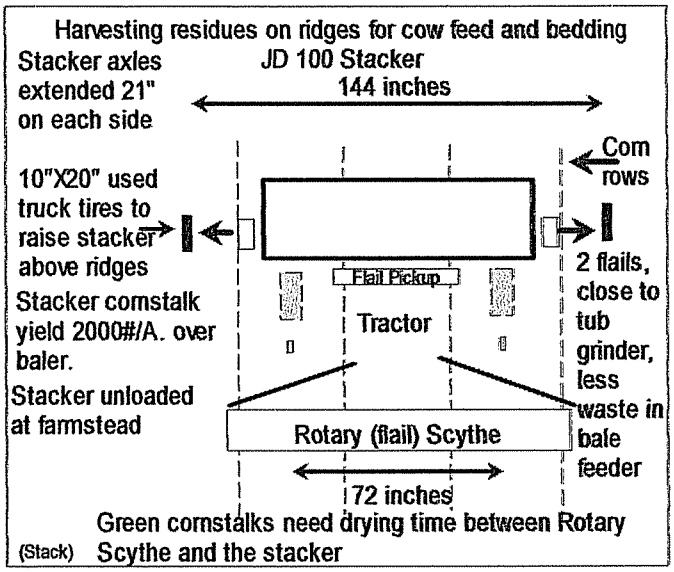


Figure 8-24

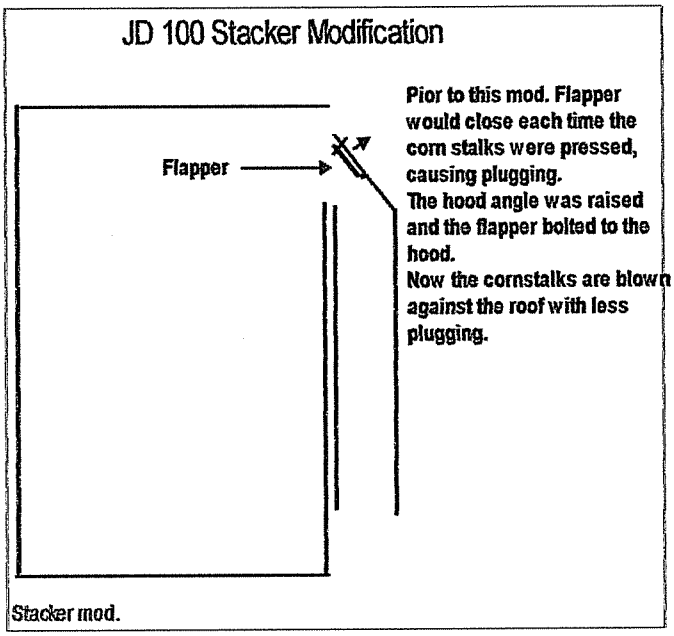


Figure 8-25

closed) baler was purchased 5/31/2000. This baler has more bars and produces a tighter bale still with a soft center. This is the only 5X6 fixed chamber baler on the market for baling cornstalks on ridges. The problem with this baler is the twine wrap system which needs to be simplified and placed up higher and out of the dirt. There are too many things to go wrong with the M&W twine wrap system. Twin wrap failures come from the following, 1-wind blows the twine off the drive wheel that moves the twine across the bale, 2-twine slippage on the drive wheel when the humidity is low, 3-twine slippage between the starter rollers, 4-wind blows the twine out of the guide tubes, 5-twine is not picked up by hooks to take twine across the bale, 6-twine dropping in front of tine bar and going underneath missing the hooks to take twine across the bale. Wind and low humidity are ideal baling conditions in Iowa, so we need a baler that will work in these conditions. Baling cornstalks on dry windy days was a real challenge in the fall of 2000. We do not recommend this baler for baling cornstalks on ridges at the present time. We kept track of the 11% twine failures in 2001 and are listed in **Table 8-3.** We are working with the company to get these changes made on the next models.

This did not happen. The 5600 M&W baler was traded in the fall of 2004 for a 814 Hesston fixed chamber belt baler. The Hesston fixed chamber makes harder bales than the other fixed chamber balers. Stay tuned.

Stacker Replaces Baler

After all the problems of baling cornstalks on ridges why not try the JD stacker again for 2002 cornstalks. The stacker was discontinued several years because of hay losses in the stack, both from the bottom and top. The stacker was taken to a machine shop to have the wheels set out to 144 inch centers **(Figure 8-24).** I'll probably not bale any residues again, but never say never. The flailing of both the rotaty scythe and stacker makes better feed for the cows with less waste and the manure pack bedding is easier to come apart with the tractor loader bucket. The stacker picks up more residues

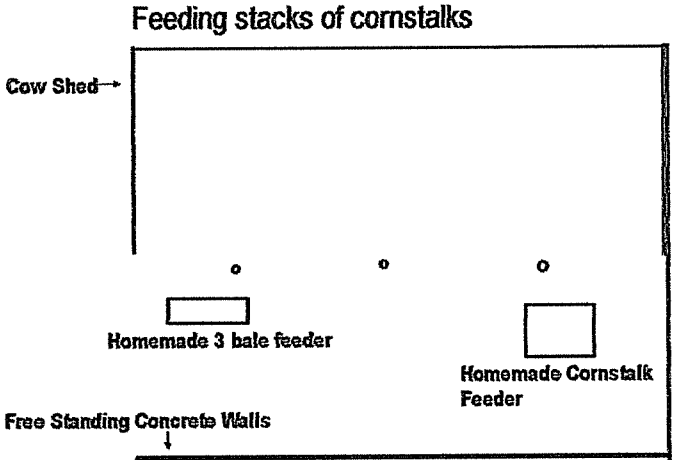


Figure 8-26

between the ridges (2000# more per acre for cornstalks). Harvesting cornstalk costs with the stacker were $31.65 per acre less than the baler. Stacker soybean residue is finer cut and used for bedding in the 4 foot wide Cargill hutches. This bedding has to be thrown in by hand with a pitch fork. Three loader buckets of cornstalks are pushed into the 10 foot wide hutches with the tractor loader. Dick will not miss the egg shape bales with loose strings or the twine misses on windy dry days or time spent under the baler replacing the pick up teeth that the ridges break off.

The second modification on the JD 100 Stacker is shown in **Figure 8-25.** The cornstalks are thrown higher into the stack wagon. The hood angle is increased and the flapper is bolted to the hood. Now the cornstalks are blown against the roof with less plugging.

Another good change in 2003 was moving the cornstalks into the cow yard as a stack rather than with the loader bucket. Details are explained in **Figure 8-26. The costs, expenses, and profits of processing the cornstalks are shown in the economics chapter (Table 7-13).**

Bale Mover

The Wheatley ten bale mover has a very easy hook-up to the tractor so one tractor can load bales in the field, haul and unload at the barn. We like the way all these machines work together **(Figure 8-23)**

Swine Enterprise

The hog operation uses a Cargill system of make-it-yourself insulated prefabricated units with open fronts. These units offer sunshine and fresh air, and their cost is less than that of a confinement unit of comparable size. The thirty farrowing "isolits" cost $937 each in 1979. A confinement farrowing building would have cost around $2000 per unit at that time. The nursery units cost $34 per head, while an enclosed building would have been an investment of $80 per head. The finishing facility out-of-pocket cost was $37 per head. An enclosed finish facility would have cost $145 per head.

Open front housing requires a good windbreak to keep the snowdrifts out of the area. The farrowing isolits are equipped with both liquid propane infra-red heaters and electric heat lamps. Two truck mud flaps are simply hung over the lower part of the nursery openings during the winter, stopping the wind but allowing enough air circulation to prevent humidity buildup in each unit. Noland nipple waterers provide clean water on demand throughout the year.

Ground corn cobs are used for bedding in the isolits. Ag lime is also spread on the floors for disease control. Small straw bales are used in the nursery for bedding. Stacked corn stalks is the bedding material for the finish unit. The manure and bedding is picked up with a tractor loader and placed in a dump wagon. The dump wagon takes the material to a side-hill bunker for storage. The isolits usually stay clean until the 8 week old pigs are moved out. At this time the inside of the isolit is scrapped clean (no disinfectants), Ag. lime spread on the floor, twelve scoops of ground corn cobs and another sow placed in the unit. The outside isolit pads are hand cleaned once a week. Manure from the isolits and pads is dumped into the gestation pens so immunity will be developed to the organisms of the farrowing units.

We feel this is a sustainable system when you consider people, environment and profitability. When you build the system yourself, you build **only one** during a life time. The dry-bedding program has built in restrictions, there would be a limit of bedding available and a limit of labor available to process bedding in and manure out. The dry-bedding is an aerobic process and odor is minimal. When it rains

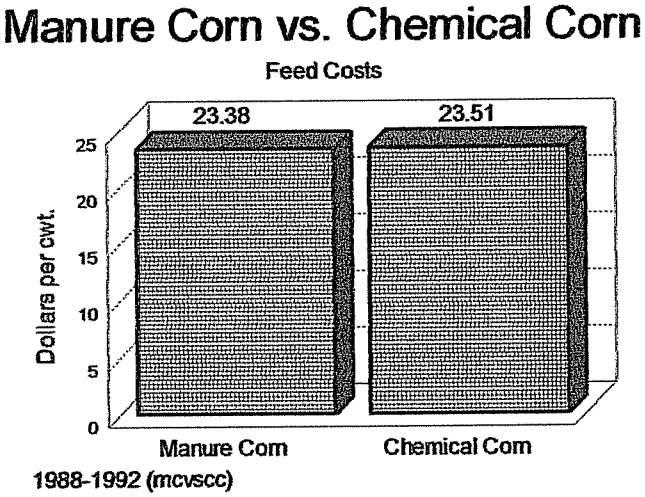


Figure 8-27

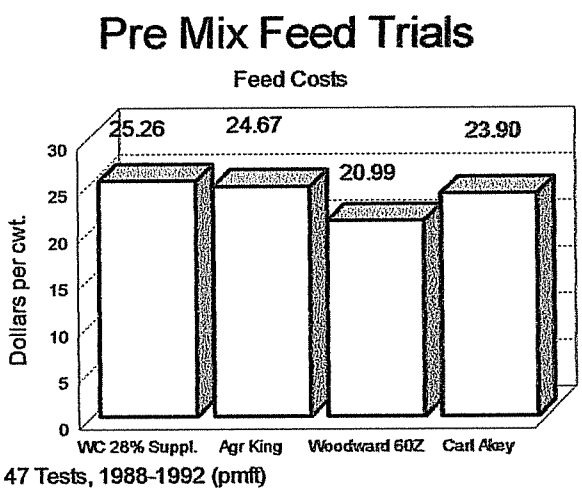


Figure 8-28

the aerobic process turns into an anaerobic process and the odor increases. At this time the pens are cleaned and the manure hauled to the storage area and the odor is gone at both locations. This is not true of anaerobic sludge from the city, it stinks all the time. The city of Boone changed the process in 1995. The raw anaerobic sludge goes through the aerobic digestion process to reduce the odor and pathogens.

Most enclosed housing systems will use antibiotics in the feed or water to guard against disease. Daily injestation of antibiotics changes the flora of the intestines and changes the odor of the manure. We think it increases the odor.

The big stink about mega hog farms is the concern about odor and rural community decline. The odor is from the **easy flush manure system (anaerobic)** that has **very little restrictions on expansion.** The dry-bedding (aerobic) system would reduce the odor considerably and restrict over expansion. The dry-bedding system would help keep people in our rural community and allow more to be added.

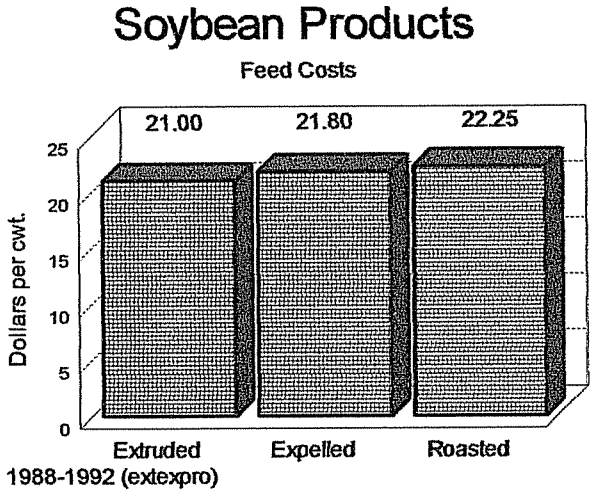


Figure 8-29

Feed Trials:

Forty seven feed trials were completed during 1988 and 1992. The trials were conducted in a Cargill nursery with starting weights of 35 pounds and off-test weight of 110 pounds. The feed inputs were priced the same for the entire period. Corn was priced at $2.50, soybeans at $5.50, oats at $1.60 per bushel and soybean meal at $205 per ton.

The feed costs were the same for pigs fed manure fertilized corn as pigs fed chemical fertilized corn **(Figure 8-27).** However during one test, the chemical corn pigs broke with the bloody scours while the manure corn pigs did not.

Tests were also conducted on different vitamin and minerals sources **(Figure 8-28).** The West Central 28% was different because it also contained the protein and rolled oats. The rolled oats made the feed costs the highest. Home grown oats are now ground for pig feed.

There are several ways to use soybeans as a protein source for swine feeding. They are extruded, expelled, and roasted.The feed costs were very similar with different methods of processing soybeans **(Figure 8-29).** Cold weather and oats in the ration increased feed use by 13 and 36 pounds per cwt. gain.

Research Project:

George Beran and research assistant Manuel Moro, ISU Veterinary Medicine, investigated the antibiotic resistance in the bacterial population of the swine herd. Antibiotics are not used in the feed or water but individual animals are given shots if needed. They found fewer resistant bacteria, although the bacteria were still present in the gut microbes. The researchers took several of these hogs back to the Vet. Medicine Research Institute and found the numbers of antibiotic resistant bacteria in the feces rose considerably. They applied a mild stress to the pigs by raising the temperature to 100 degrees F. The antibiotic resistance jumped again.

Stress increased the number of antibiotic resistant bacteria.

Practices to reduce stress:

1) Agriculture lime is spread on floors to raise the pH level.
2) Manure is moved weekly from farrowing units to sow gestation pens.
3) Probiotics are added to sow and small pig rations.
4) Use good sound management practices.
5) Use open front draft free buildings with adequate bedding to provide protection from the weather. Pigs will have access to fresh air and sunshine.
6) A medium frame hog (Farmers Hybrid) with more lung capacity is necessary for an outdoor environment.
7) Wean pigs at 5 to 6 weeks of age.
8) Sow gestation ration should have oats and ground ear corn included for bulk.
9) Use nipple waters to provide clean water at all times.
10) For bathroom training, chase the hogs out of bed in the morning before they awaken.
11) Bedding is essential for saving nutrients, animal comfort and odor control.
12) A windbreak is a necessary part of a open front housing in a northern climate.
13) The number of pigs in the finish unit is changed in order to keep the sleeping hutches full in the winter time. During the winter 30 to 35 market weight hogs for each hutch and 20 to 25 during the summer.
14) During the winter corn stalks or straw is pushed into the finish unit sleeping hutches by the loader tractor. Pigs push the bedding out in two weeks time.
15) The inside of the isolits are cleaned after the pigs are moved out, the floors are scrapped clean (no disinfectant), a five gallon pail of ag. lime is spread on the floor, twelve scoops of ground corn cobs are placed over the lime and a new sow is moved into the isolit.
16) The isolits are heated by LP infra red gas heaters during the cold winter months. 125 or 250 watt heat lamps warm these houses during the spring and fall months.
17) Two truck mud flaps are used to cover the lower front of each nursery sleeping unit during the winter.18) The nursery hutches are limed each day. The finish and gestation sleeping hutches are limed each week.
19) The pens are cleaned approximately every two weeks, a dump wagon is used to haul the manure to the storage bunker.
20) Vaccinations are used only when necessary.
21) There is no perfect hog system, but this one has lowered the stress on both people and the pig.

1995 Observations

Hog Feeder Experiment

We have used Smidley wood feeders since 1979 (80 bu. retails at $1490). They are costly and have been back to the factory for rebuilding once at about half the cost of a new feeder. The Smidley feeding area is divided into separate eating comparments. The pigs eat out of every other comparment and that leaves stale feed in one-half of the feeder. This feeder feeds down from the top and if it is not cleaned out or allowed to run dry between additions of new feed, the pigs sort through the feed and push feed out of the feeder with their noses.

The Soderholm metal rocking 100 bu. feeder retails at $880). There are no compartments, just one long feeder trough. The pigs rock the whole feeder and move the feeder pan up and down to get the feed. The grain feeds from the bottom. The feed flow is adjusted by one bolt on each end of the feeder. The rocking feeder works best in a fence line with the same size pigs on both sides. Pigs may eat out of just one side if this feeder is in the middle of a pen.

We are comparing these two feeders for feed waste and pig preformance and the results are found in **Table 8-2.** This is only one trial and these results are not the last word on feeders. There was a tendency for the Smidley pigs to gain faster and eat more feed, while the Soderholm pigs were more efficient. There was more feed wastage with the Smidley feeder. There was more variation in weight at slaughter in the Soderholm pigs. We need more tests to verify these beginning findings.

B&W Rocking Feeder

B&W of Columbus, NE bought out Soderholm Mgf. of Worthington, MN. The two feeders are very similar but the Soderholm feeders had a washer

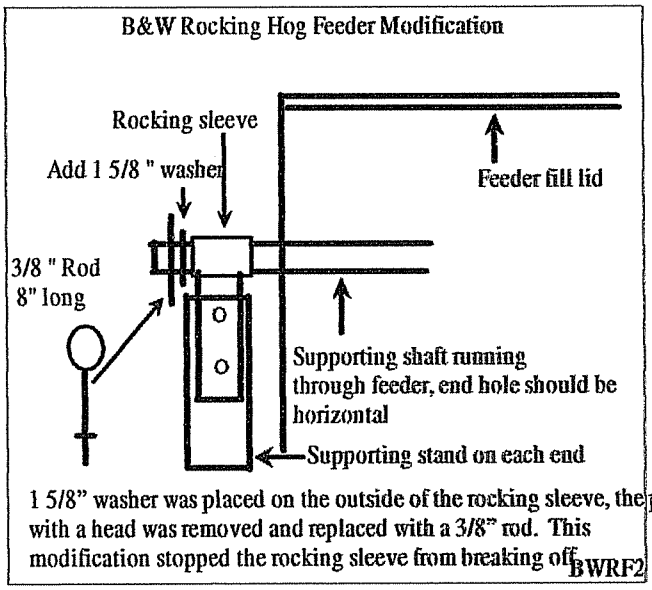


Figure 8-30

between the horizional rod and the rocking sleeve. B&W feeder has a vertical pin with head. The B&W MFg. didn't think a washer was necessary on each end and would cost $15 per feeder.

We had four B&W feeders in use and all eight of the rocking sleeves have cracked or broken off. As each one would crack, we would weld the crack and weld on a strap to strengthen the connection between the sleeve and the vertical stub. This procedure only delt with the effect and not the cause of the problem. The cause of the breakage problem was as the hogs rocked the feeder the head of this pin would wear a groove into the rocking sleeve stopping the rocking action. As the hogs tried

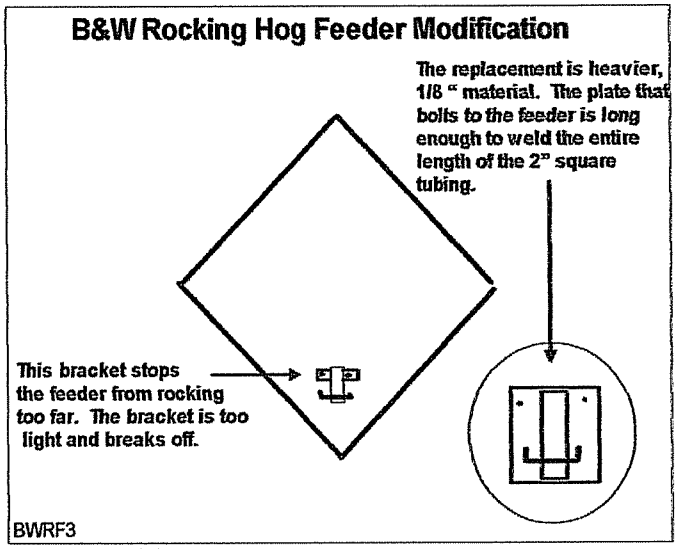


Figure 8-31

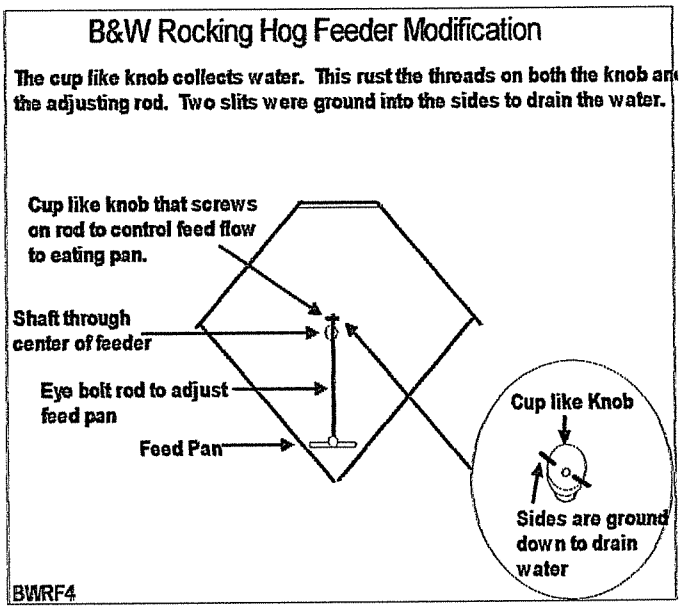


Figure 8-32

to move the feeder, great stress was placed on the sleeve until it cracked, or broke off, and then the feeder fell to the ground.

The problem was solved by purchasing a 1 5/8 inch washer at a machine shop that fit nicely over the shaft that runs through the feeder. The cost for 2 washers was less than $2.00, not $15.00. The small pin was replaced with 3/8 inch rod eight inches long. The top 4 inches of the rod is made into a loop and this enables the rod to support the entire diameter of the washer **(Figure 8-30).** We used bearing grease on the new sleeves to make the feeder rock with ease. All 4 feeders are rocking nicely now. As of March 2002, The B&W feeder has a washer but still the vertical pin with head. All the weight of the feeder is still at the top where the pin head is located. It would be better to have the holes through the feeder shaft running horizionally distributing the weight evenly to both sides and also using a washer and a rod.

Sows are hard on feeders. The bracket that stops the feeder from rocking too far are breaking off. As this happens heavier brackets are made here on the farm **(Figure 8-31).**

We have 12 B&W feeders in 2003 and all adjusting feed knobs have two grooves cut in the side of the knob to drain the water away from the threads of the adjusting rod (Figure 8-32).

Pseudorabies

The Thompson farm was quarrentined for pseudorabies in 1983. Our boar supplier bought back boars two different times and found them positive for pseudorabies both times. There were no visable signs of this disease. During the last few years there has been some reproductive problems. In the fall of 1994, the state wanted all hog farms tested for pseudorabies. All the sows that were tested were positive. Later all the gilts that were tested in the finish unit were negative. It was time to sell the old sows and start with new gilts. The gilts were vaccinated three times and have been blood tested six times and have remained negative. Even other hogs in the finish unit that were not vaccinated are testing negative. There was really no disinfecting problem since all this happened during the winter time. The negative gilts farrowed in the isolits right after the positive sow litters was removed. Ag lime was used on the floors after cleaning. This is not a recommendation but just relating the experience during 1994-1995.

1996 Observations

The metal posts in the divider fences of the finish unit were rusting and some had been replaced. This situation became a never ending job. Concrete walls were poured around the fence and the hog panels along with the metal posts served as reinforcing for the concrete walls. Any new construction of Cargill outside units would use pre cast stand up walls inside and outside of building.

The outside concrete walls changed the dunging habits of the pigs. The pigs dung now at the front end of the excerise run instead of just in front of the hutch. The walls made a warmer environment with less draft in the winter. Our outside pen width is ten feet. The bedding outside the hutch stays cleaner now and as the weather warms up the pigs will sleep outside the hutch. Pigs laying outside with the wire panel dividers was a no no because of drafty conditions. There is less wind movement in the summer so the sprinklers are more important.

Crud board was used as ceiling insulation in the sleeping hutches when built in 1979. This board sagged and the birds made nests under the ceiling. The galvanized steel was removed, the crud board was destroyed and replaced with 1/2 inch plywood. All spaces over rafters, between nailers, were filled in with a 2 by 2. The steel was screwed back on and this is the way it should of been built the first time. The birds are not nesting now in the finish unit and if the birds can't nest in a building they usually won't roost there.

Gestation Sow Feeders

Sows were fed on the concrete floor east of the sow barn for many years. You had to be fast to get the feed dumped before the sows dumped you. Sow feeders were purchased from Raider Pre Cast (1-800-826-8159) for $145.00 each plus freight. The feeders were set in the fence line. The feeders work fine except when it snows. As of 2001, these feeders are no longer manufactured.

Winterized A Frame Isolit

Hopefully a better isolit can be made with a triangle structure rather than using the Cargill box structure. The building uses 8 foot material making the floor space 8 by 8 and the peek height about 6 1/2 feet. The walls have 3 1/2 inches of insulation, covered with 7/16 inch plywood, felt paper, and steel roofing on both outside and inside.

The first proto-type A frame has a south open-

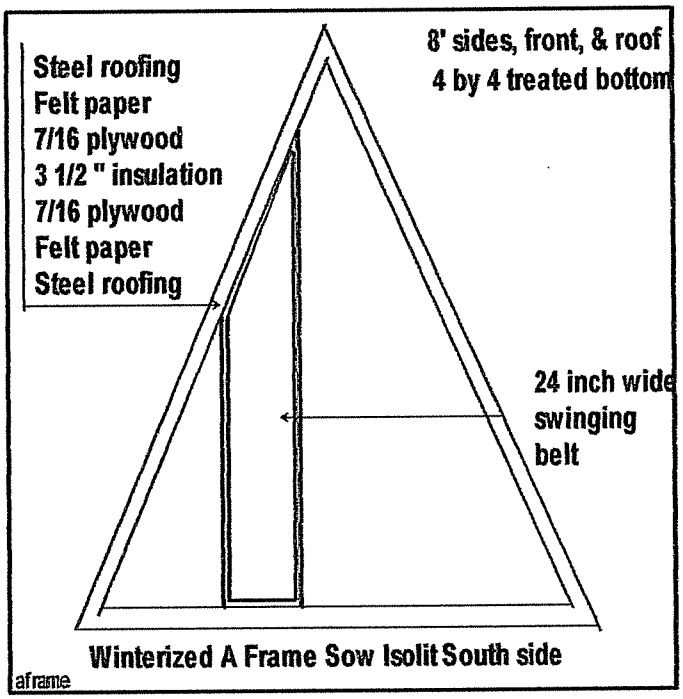


Figure 8-33

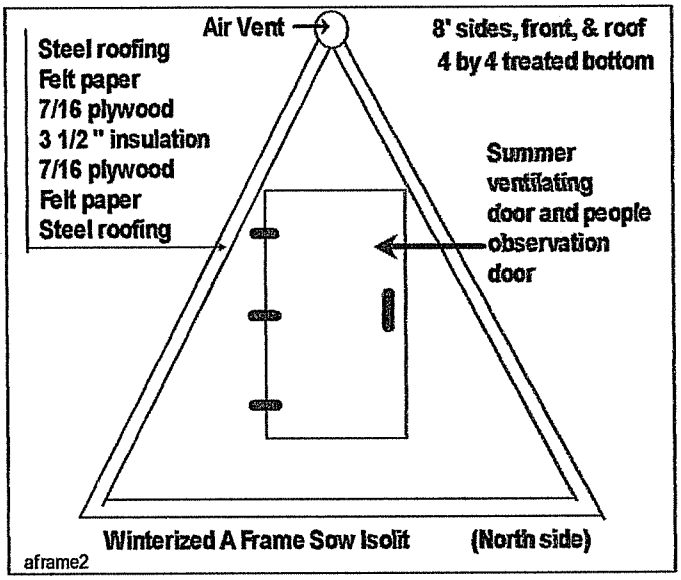


Figure 8-34

ing 26 inches wide in the center of the isolit. This opening is too large in the summer when it's raining. Two pieces of 3/4 inch plywood fold down to form an inside ceiling 29 inches off the floor. A heat lamp is set in the plywood ceiling at the back of the isolit. The little pigs nested under the heat lamp but could not be observed from outside the isolit. There was no vent in the top of this proto-type. Pigs did not perform satisfactory during the winter when the back door was closed and when the front opening was partially covered.

The second proto-type has a south opening 24 inches wide and off set to the left of center and goes all the way to the roof **(Figure 8-33).** The 24 by 48 inch mud flap is cut to swing freely in the opening. The top part of the sow opening can covered as needed. Ground corn cobs are used for bedding. For summer cooling, a two by four foot ventilation door is across the north bottom side of the isolit as well as a vent at top of building. The sow in the A frame was cooler than the sows in the Cargill isolit.

A pig nursery with heat lamp is located in the southeast front corner of the A frame. The ceiling of the pig area is 15 inches off the floor and a hanging flap can be used to contain the heat. The A frame house has no floor and will set on a concrete pad. There is approximately 48 square feet floor space for the sow in the A frame and a 4 by 7 foot space, or 28 square feet, for the sow in the Cargill isolit. There can be more people contact with the sow and little pigs with the 6 1/2 foot high A frame. The Cargill isolit was not safe to be in with a cranky sow. It is much easier to clean an A frame standing up instead of down on your hands and knees in a Cargilll isolit.

During 2002-2203 the inside arrangement is being changed to be more people friendly. The back horizontal ventilation door will be a vertical ventilation and observation door **(Figure 8-34).** This will allow people to observe the animals and enter the A frame from the back side. The creep area is located in the back 2 ' of the house **(Figure 8-35).** A 105 watt heating pad and a 250 watt heat lamp will supply the warmth for baby pigs. In extreme cold a LP heater is standly but will be turned off when the baby pigs find the heating pad and lamp. Heat pads were purchased from Kane Mfg. in Des Moines 1-800-247-0038. The sow area is 6x8 feet compared to the 4x7 feet in the Cargill unit. **Figure 8-36** shows the layout of the 30 isolit units.

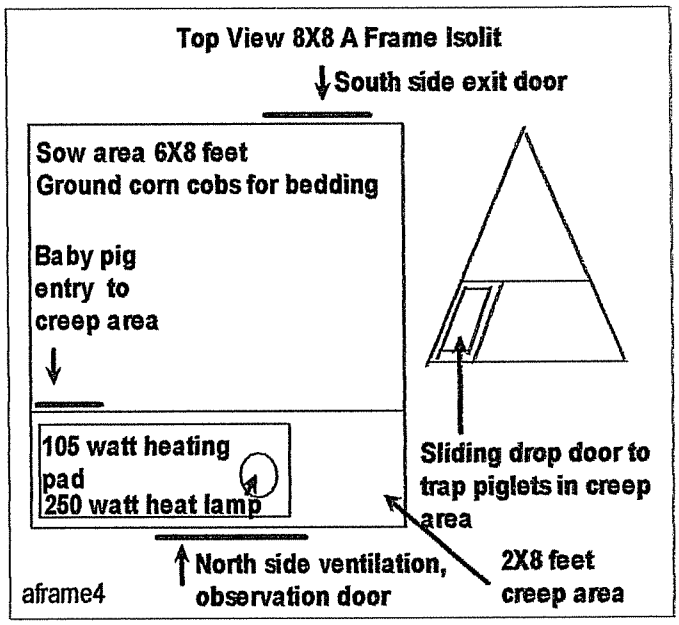


Figure 8-35

Lactation Sow Feeder

The old wooden Smidley individual sow feeders have been replaced 3 or 4 times during the last 20 year period. The feeder pan was too small and was positioned back under the feed container. The sow did not like the feeder. She would get down on one knee, root out the feed, and then eat the feed off the floor with much of the feed wasted. These feeders needed filling each week. Many sows would dung and urinate on the feeder lid.

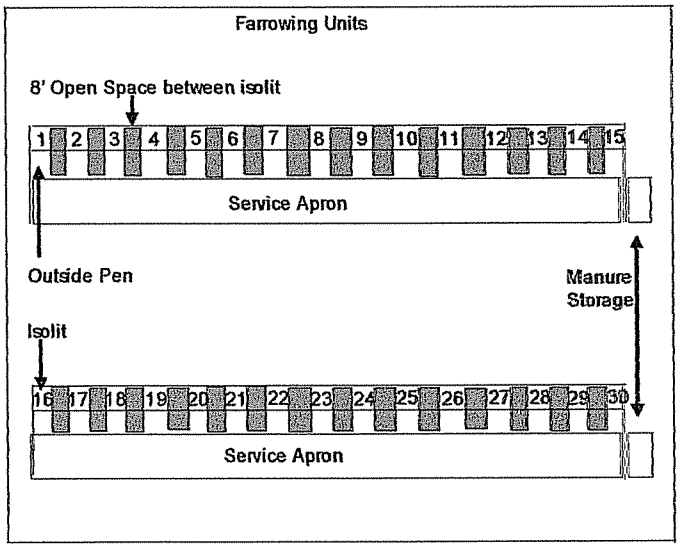


Figure 8-36

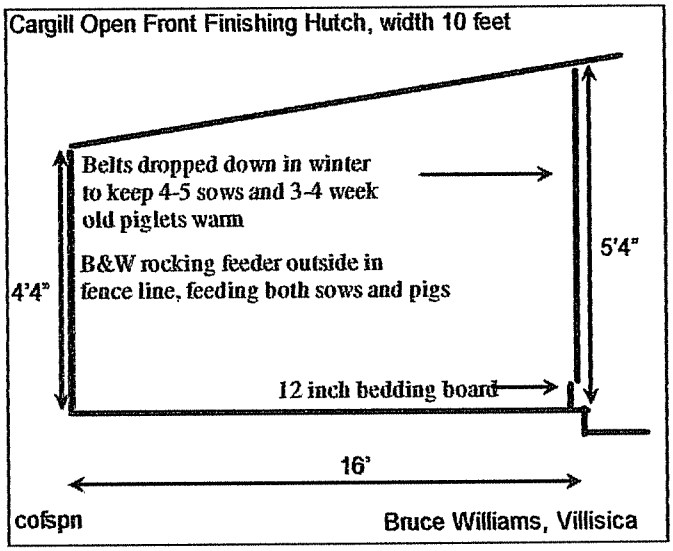


Figure 8-37

The new prototype Smidley sow feeder is moved outside the pen. A hole is cut in the bottom of the fence allowing the feeding pan to come back into the pen. This prototype is made of stainless steel and should last a long time. The pigs learn from their mother to eat out of this same feeder. Now the sow is not wasting less feed with the larger feeding pan. The feeder had to be modified because the sow could push the adjusting feed slide to far back resulting in feed wastage. A rod was placed across the feeder behind the slide. This feeder is somewhat larger and needs filling only once in three weeks.

Added Value Pork

The gourmet restaurants in San Fransico, California do not want the extemely lean meat from hogs with all white breeding. Japanese meat buyers are paying premimum for hogs with 1/2 Berkshire breeding. Both these markets want marbling in the meat which improves the taste.

Niman Ranch is buying Rex's hogs for the fancy restaurant trade and Whole Foods chain. Niman Ranch buys hogs that are raised outside with bedding, and that have the right kind of breeding to put marbling in the meat. Meat animals sold through Niman Ranch have received no growth hormones, subtherapeutic antibiotics, or other growth promotants. Rex's hogs have Farmers Hybrid (Boar Power) breeding for many years with a mix of white and colored breeds. Niman Ranch contact person in Iowa is Paul Willis at 515-998-2683.2001 Piglets C

2001 Piglets Change

Prior to this time, pigs were left in the isolits until they were eight weeks of age. During the winter, they needed gas heat until they were moved out and they still messed inside the isolit. Five sows and their three to four week old pigs are moved into a finish unit hutch and pen. Belts are hung across the hutch four feet from the front. A 2x6 bedding board was placed below the belts. The sows and pigs in this bedded area keep warm without supplemental heat. This idea was copied from Bruce William's hog operation at Villisca, Iowa. This worked fine for 2001-2002 mild winter but the colder 2002-2003 winter caused problems in keeping the pigs warm and clean. They dunged on the front 4 feet of the hutch and worked their way back untill the whole hutch was a mess. **The belts were moved to the front and used the regular 12 inch bedding board.** Now 4-5 litters are put in each hutch **(Figure 8-37).** The sows and piglets eat from a B&W rocking feeder that has been modified with a 1 5/8 inch washer and the 3/8 inch looped pin **(Figure 8-30).** This change will make cleaning of the isolits much, much, easier and save on the supplemental heat bill for each litter of pigs farrowed in the colder weather.

Finish & Nursery Change 2003

The past few years Rex has noticed when the pigs were moved from the nursery to the finish unit they seemed to stall. After that observation, some pigs were left in the nursery until they went to market

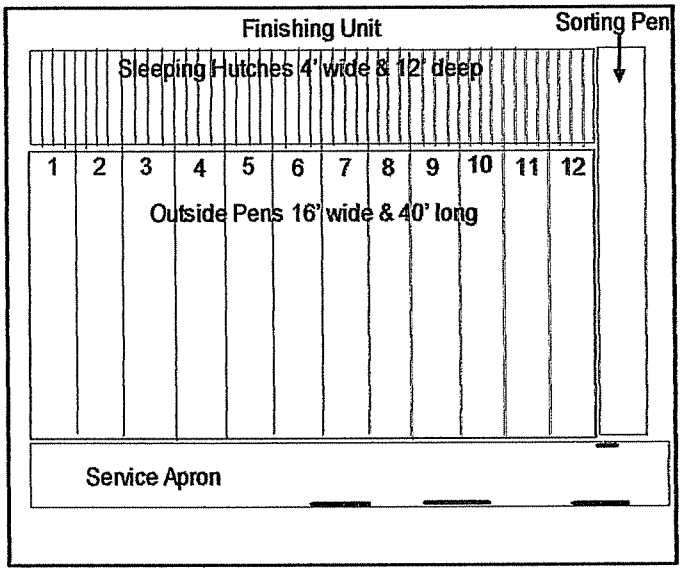


Figure 8-38

and the pigs did better. There was less death loss with the smaller hutches and larger outside pens. There are less pigs in each sleeping area, lower ceilings and less draft in the smaller units. Knowing these facts and moving sows with litters into some of the finish unit pens, we decided to double the nursery units and use it for finishing the pigs. We call this the south unit now with 12 pens. Each pen is16 feet wide with 4,four feet wide by 12 feet deep hutches to sleep in. The 16 feet wide pens are alot easier to clean than the 10 feet wide north row units (**Figure 8-38.** Two by twelve by 16 feet bedding boards are permanently installed across the front of the hutches in each pen. Door slides were made to close off two

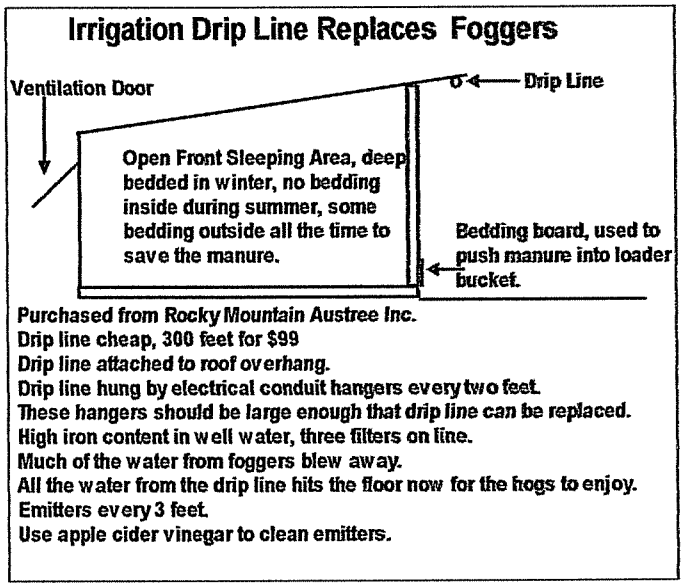


Figure 8-39

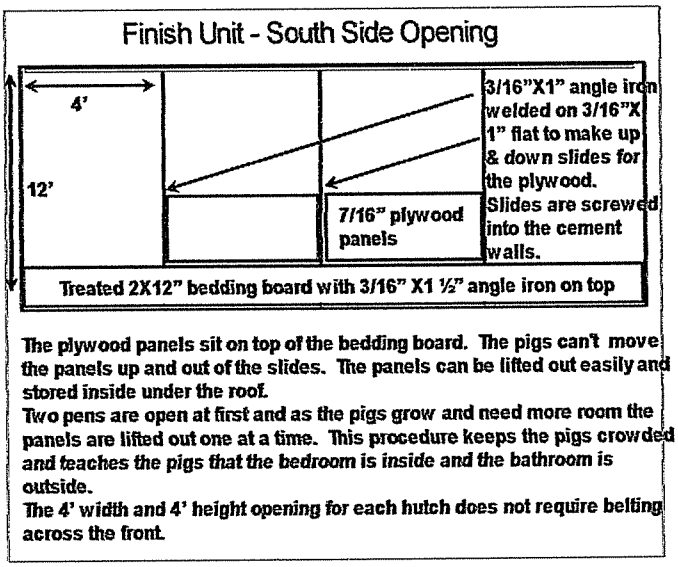


Figure 8-40

or the four openings. As the pigs grow a door slide is taken out and hung inside to give the pigs more room for sleeping area. Hanging belts are put up for new small pigs in very cold weather. Stacked bean straw is dumped in front of the hutches and hand pitched into the hutch. Bean straw is easier to hand pitch than cornstalks.

Another change in 2003 was replacing foggers with Austree irrigation drip line to cool hogs. Much of the water from the foggers was blowing over the top of the hutches. Details are shown in **Figure 8-39.**

Figure 8-40 shows how to train pigs that the bedroom is inside and bathroom is outside the bedding board. Pigs need to be crowded to establish good dunging habits. Details are found on the chart. The angle iron stops the pigs from chewing the bedding board.

Hog Loading Chute

Hogs usually have their head on the wrong end when it comes to loading. Loading hogs can be very trying on human relationships. Anything that would help keep both the hogs and the people clam would be of great help. Sharon says ladies should sort and load hogs with their husband to be before they get married. Solid panels and gates are a great help. Temple Grandin's idea of loading two hogs at a time makes sense. We built a two alley loading chute with a see through panel so that the hogs could not turn around (**Figure 8-41).** This **did not** work because a hog would be going in on one alley and a

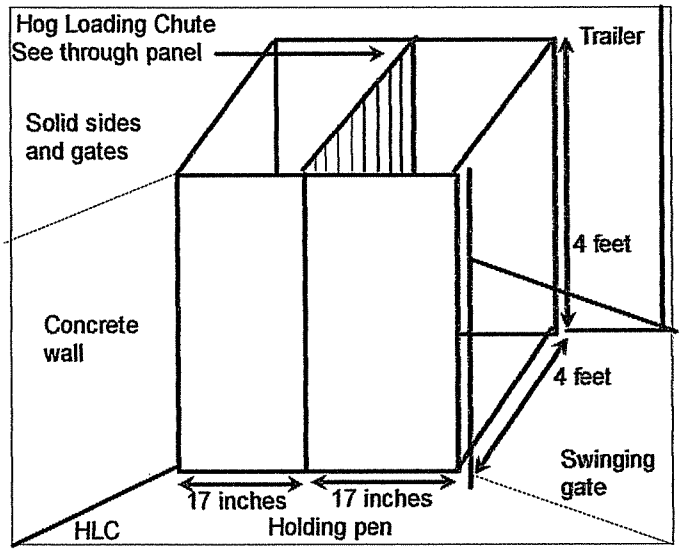


Figure 8-41

hog coming back out on the other alley. There was no way Sharon could open or close the door on the back of trailer to get the hogs loaded. Dick had seen a picture of one way self closing door in a farm publication. He could never figure out how to install this idea on the trailer door without it being in the way when not loading hogs. How about putting the pair of one way self closing doors on the front of the four foot long two alley chute? We could not find the picture that Dick cut out of the magazine. We guessed at 5 inch opening on each side and that works **(Figure 8-42).**

The two alley loading chute is now a single alley loading chute in 2004 and works much better. The left alley is pushed to the left passed the concrete wall and is not used. There is less room for the hog to turn around prior to getting to the loading alley.

Another light came on about the two corraling hog gates that never came together. The gate that was bringing 16 hogs into the corral never went past center and was chained to the pen gate. This left a space we tryed to fill with people with hand panels and the hogs always won. Now the back gate goes past center and is chained to the front gate and the hogs are caught **(Figure 8-42).** While we sorting the remainding 14 hogs for the rear half of trailer, some of the 16 are loading themselves with the door slamming behind each hog. Before these two changes it took 6 people to load hogs, now 2 people can get the job done.

Human Nutrition

Back in 1967 we made a decision on taking vitamin/mineral supplements for ourselves. Some were saying we need supplementation and the doctors said that humans get adequate vitamins and minerals from their diet. **Figure 8-43** lists all the vitamins and minerals added to a swine diet. A swine or beef producer would not think of feeding animals without adding vitamin/mineral pre mix to the ration. We take better care of pigs than we do

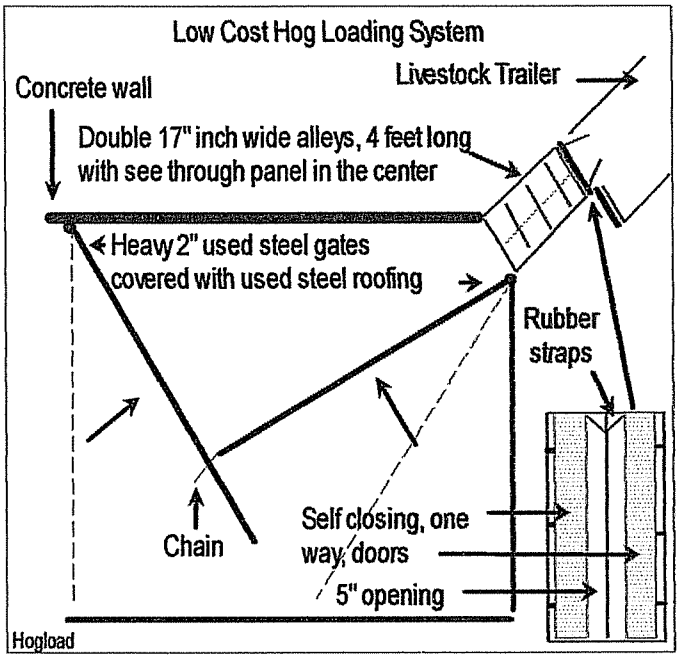


Figure 8-42

Vitamin Mineral Premix (Swine)

Vitamin A	Calcium
Vitamin D3	Phosphorous
Vitamin E	NaCl
Choline Chloride	Magnesium
Niacin	Manganese
d-Pantothenic Acid	Copper
Riboflavin	Iron
Vitamin K	Zinc
Vitamin B6	Iodine
Folic Acid	Cobalt
Biotin	Selenium
Vitamin B12	Potassium Cloride
	Potassium Sulfate

Bacillus Subtillis Fermentation

vitmin

Figure 8-43

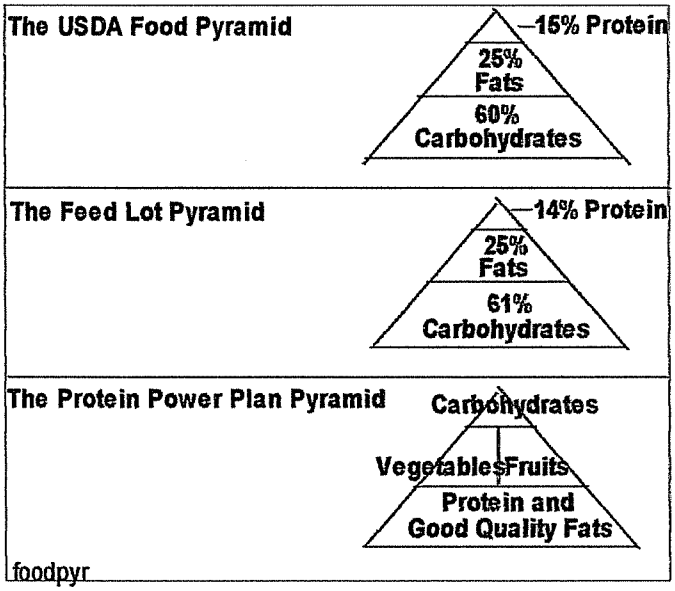


Figure 8-44

ourselves. We have been on supplements since 1967 and added potassium supplements in 1999.

Medical doctors have been telling us to restrict the intake of meat, eggs and cheese. The top pyramid in **Figure 8-44** represents the restriction of protein with the base of the diet being carbohydates. We were trying to lower the fat intake but we ourselves were getting fatter. The middle pyramid shows how to make a ration to fatten animals. The people and the animal diet are the same, both people and animals get fat. This was proven when we increased the starch in a heifers diet, they became extremely fat.

Higher Protein Lower Carbohydrate Life Style

Good news for livestock producers

A new paradigm for the medical profession, lowering f intake does not reduce fat storage in the body, reducin carbohydrate (starch & sugar) requires the body to burr fat for energy resulting in weight loss, lower cholesterc and better health, starch is changed by acid hydrolysis into sugar to be used by the body, cooking and processing starchy foods speeds up the break down process.

The more cooked or refine starch & sugar you consume the faster the blood sugar rises, body pumps large amounts of insulin to move sugar into the cells but brings insulin resistance & promotes fat storage causin overweight, abdominal obesity (beer belly), high blood pressure, elevated cholesterol & triglycerides, diabetes heart disease, all this is called syndrome X epidemic.

hplcls

Figure 8-45

The bottom pyramid is a complete change, protein is the basis of the diet with restrictions on the carbohydrates. In January 1999 we heard that some doctors were saying in order to lose weight and improve your health, we eat more protein and less carbohydrates. It worked, Sharon and Dick together have lost 60 pounds, Dick's waist came down from 40 inches to 35. This new health paradigm fit with our farming paradigm of balanced agriculture with animals. Animals that produce meat, eggs and cheese are needed to have a more sustainable balanced agriculture. Longer rotations requires animals to eat the forage.

How does this new idea work? Lowering the starch and sugar intake requires the body to burn fat as the energy source resulting in weight loss, lower cholesterol and better health. Starch can not be used by the body as starch, it is changed to sugar by acid hydrolysis. Cooking or processing the starch speeds up the breakdown causing higher blood sugar after a meal, the body pumps large amounts of insulin to move sugar into the cells, this brings on insulin resistance and promotes fat storage causing overweight, abdominal obesity (beer belly), high blood pressure, elevated cholesterol and triglycerides, diabetes and heart disease. All this is called syndrome X epidemic **(Figure 8-45)**.

The Japanese and Chinese diet is based on rice, which is starch but they are not fat. Most of the rice is eaten as a cooked whole grain, not highly processed. Americans eat most starch that is processed, like ground wheat, super fine into white bread, some potatoes are highly processed into chips, corn is highly processed into chips as well. These highly processed starches, when eaten, change very fast into sugars which causes rapid rise in blood sugars.

The medical profession agrees on eating mutiple servings of green vegatables each day, raw if possible, the less cooking and processing the better. All doctors reecommend drinking 64 ounces of water a day, not pop, not coffee, not beer, but good quality water. Humanity knows this is right, but we stuggle getting the job done. We have been distilling our drinking water for over 30 years because of the bacteria, high calcium and iron content.

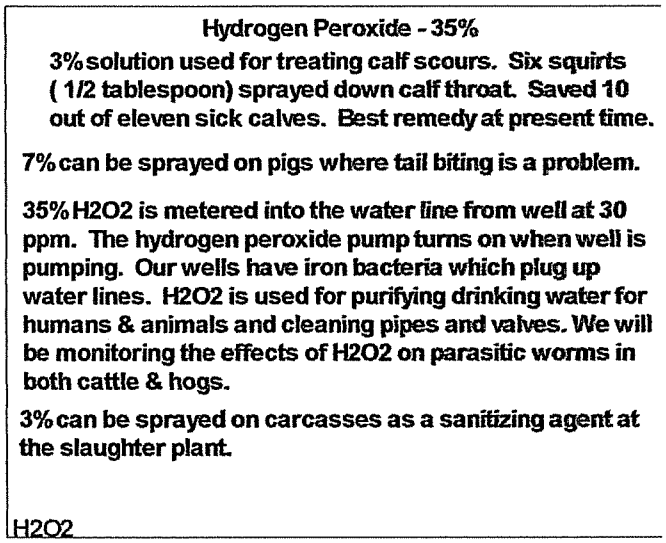


Figure 8-46

Hydrogen Peroxide

Hydrogen peroxide is an alternative to antibiotics. H2O2 is a tool not the toolbox. Sanitizing the water supply with H2O2 has shown to help with respiratory infections, strep, stomach ulers, ileitis, and E. Coli scours. **Results will depend on good or bad the condition of the water supply.** H2O2 will clean up water pipes and valves and increase water consumption. 7% solution can be sprayed on pigs where tail biting is a problem. 3% can be sprayed on carcasses as a sanitizing agent at the slaughter plant **(Figure 8-46).**

With the increase of smog in the environment, people are going to oxygen bars and hooking up to oxygen tanks to put more oxygen in their brains. H2O2 may be a way to put oxygen into our systems for both humans and animals.

Rain droplets will pick up extra oxygen in a rain storm. We keep our test strips for checking H2O2 concentration in the house refrigerator. Dick wanted to check the concentration of H2O2 from a cattle waterer, came to the house for a test strip, it was raining some, tried to keep the strip dry but it was turning light blue (10 ppm)before he tested the cattle water. Cattle like rain water coming out of rain spouts, is this the reason for increased consumption of water treated with H2O2?

Our experience with H2O2 is as follows, two wells are being treated with 35% at a 30 ppm level. We are monitoring parasitic worms in both cattle and hogs. Our wells have iron bacteria and ph is 7.8.

Seven squirts or 1/2 tablespoon or 7 ml of 3% sprayed down calf's throat was successful on 10 out 11 calves with calf scours in 1999. Treated 11 in 2000 and lost 1 from scours. Best remedy we have found. Tom Frantzen said in 2003 that this treatment is miraculous for calf scours but does not work on pig scours.

During December 2000 bloody scours was observed in both cattle finish yards. These cattle had access to free choice high quality third cutting mixed hay and ground ear corn with raw soybeans as protein. Hay was changed to stubble cutting, soybeans removed from ground ear corn and H2O2 increased to100 ppm. The bloody scours went away and the coughing in the cattle improved greatly during this treatment.

Farm Windbreaks

On our trip to China in 1976 we saw trees planted on both sides of streets and roads. We need trees planted along the roads and in our fence rows. A four row windbreak was planted in 1978 and 1979 on the west and north side of both farmsteads. The outside row was honeysuckle, next a row of green ash, next scotch pine, and the inside row was concolor. Not the best choices, the honeysuckle were attacked by a mite that spread a disease causing witches broom. The seeds from the green ash

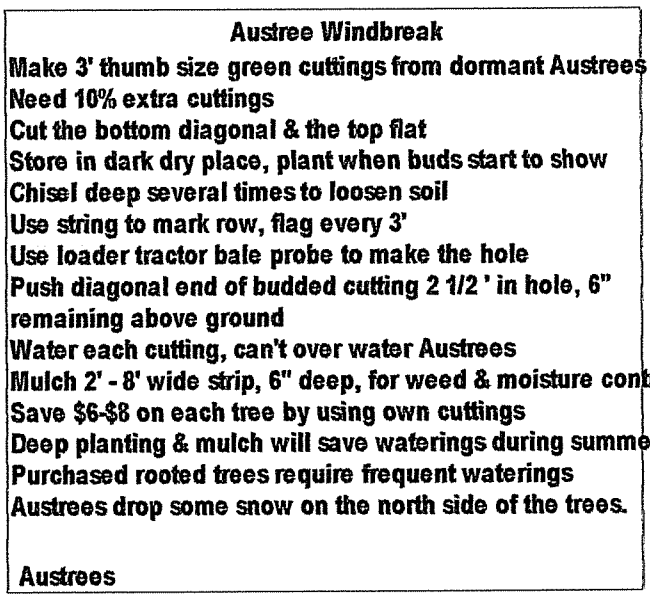


Figure 8-47

sprouted new trees all over the place. The scotch pine are dying in 2000 and will have to be removed. The concolor look nice on the higher ground but did not survive in the low wet areas.

In 1996 we planted a row of Austrees on the north side of both windbreaks. These trees, in 2002, are as tall as the ones planted in 78 and 79. We lost less than 5 trees out of the 120 planted. We are very satisified with the growth of the Austrees and the added wind protection.

Planting the windbreaks around the farmsteads is one of the better things we have gone since we started farming. We can remember the snow drifts around the buildings and in the yards before we had the windbreaks. It is night and day difference behind the windbreak compared to the open fields. There should not be any question about whether windbreaks pay for themselves. The evidence is that less feed is needed by the animals to keep warm and costs are reduced with (non- supplemental heat) waters without lids that work in the winter. We think our heating cost for our 2940 square foot floor space house has been very reasonable being $439 per year for fuel oil and $489 per year with LP which includes a gas clothes dryer (Table 8-4).

In February 2001 we took 3 foot cuttings about the size of your thumb from our Austrees. Make a diagonal cut for bottom and a horizonal cut for the top of the stick in order to know top from bottom. In preparation, the ground was chiseled deep several times. A 12 foot drill pass planted an oats and hay mix. A rod was pushed into and pulled out with the loader tractor to make holes for the cuttings. The diagonal end of the **live budded** cutting is pushed into the hole leaving 6 inches of the horizonal cut above ground. You want the roots to grow faster than the tops in the first year. The cuttings were watered with a drip line. The headed out oats were too competitive, so they were cut off. A woodchip mulch was placed around the trees but the cut off oats germinated and came up through the mulch. Austrees grow very fast and are 5 to 6 feet tall in a years time.

About 35 cuttings were planted in 2002 on the south side of hay shed to stop the southwest winds. Oats will not be planted in 2002 eliminating the competiton for water. A strip will be chiseled deep to loosen the soil for fast root growth and a woodchip mulch will be placed around the cuttings to keep the weeds in check. Using our own cuttings saves 6 to 8 dollars per tree. Purchased Austree plantings require lots of water the first year. We don't think you can over water this tree. The 3 foot cutting placed 2 1/2 feet in the ground with a thick mulch will take much less watering. We give the cuttings a good soaking at planting to get the soil tight around the cutting. We use the Boone County Fair bedding for mulch **(Figure 8-47).**

Ninety some cuttings were planted in 2003 to replace dead Scotch Pine trees in a four row windbreak around the farmstead. Plan A - Dick used the the chain saw on one tree, dragged the tree behind the tractor to the burn pile,lost most of the branches, and the root still in the ground. Too much work. **Plan B: Used pallett fork on loader tractor to push over dead tree, then put pallett fork under the branches lifted tree and roots up and hauled tree upright to the burn pile. Stacked the trees like a te pee, whow what a bon fire.** Now with the roots gone the area can be chiseled. The bale probe on the loader tractor is now used to make holes for the cuttings. A eight foot wide woodchip/sawdust mulch was put down with loader bucket to prevent grass competition. This row is between the Green Ash and Concolor rows. Can the Austrees start and compete with 20 to 30 foot mature trees on each side? If not the Green Ash spouts will fill in this space in time.

Many more of the dead Scotch Pines were removed in 2004 and planted to Austrees.

Grain Quality

A corn sample from our farm was placed in a plastic container with lid. This sample of corn was dried naturally on the ear, shelled with a regular stationary cornsheller and then placed in the container. Another sample was taken from corn purchased from local elevator, this corn had been shelled wet in the field by a combine, hauled wet to the elevator and fast dried with gas heat. No date was marked on these containers, but we guess the corn is 5 or 6 years old. The elevator corn went bad in 2000 and the ear corn shelled dry 5 or 6 years ago looks just like new shelled corn. We are doing this demonstration over and the dates are marked on the containers.

Ear Corn & The Coons

Ear corn has many advantages with no drying cost and ground ear corn makes excellent cattle feed. The disadvantage is rodents, we have already talked about rats so our discussion here will be about raccoons, squirrels, rabbits and opossums. The openness of ear corn cribs invites lots of critters. Farmstead windbreaks are needed but they bring rabbits. Dick carries a rifte on the JD gator and shoots about two dozen rabbits a year so we can save our garden. Raccoons pull corn out of wire ear corn crib and chew holes in the filler doors on top of the crib. The coons dung all over the top of granary bins in the cement block ear corn crib. A raccoon trap was purchased in 2001 and placed next to the wire crib. Half rotten apples picked up from under the tree are excellent bait. The trap results were good, 13 coons, 1 opossum, and 1 squirrel. Five coons were also shot with the rifle. We haven't seen a coon in a long time. Stay tuned.

On-Farm Scale

All the data that is found in this book would not have been possible without a scale located on this farm **(Figure 8-48).** The scale has to be handy and easy to use. Harvesting is a busy time and the pressure is on to get the crops taken care of. Hauling each plot to a elevator may be exciting at first but the excitement will soon wear off. One of the best investments that the SARE program could make is to pay half the expense of a scale on a farm. With a scale handy you will check out many other things than just single plot experiments.

Rats

Rats are problems on livestock farms with stored grains and concrete feeding floors to hide under. Our concrete stave ear corn crib with over head bins has been a good home for rats since it was built in 1952. The drive through alley floor had to be replaced once because the rats undermined the drive way. Our burn pile was not too far away which served as another place to hide. We spent lots of money for rat poison and the rats developed resistance.

At our September 1998 field day we talked about this problem. Don Adams, local farmer, told how his father, caretaker of the Ledges Wildlife Exhibit, solved their rat problem. They built feeding stations under doors that were 3 inches off the ground which could be enclosed to fumigate with engine exhaust. John Creswell, ISU extension shared his experience with gasing rats and warned about exhaust back pressure could ruin the engine.

In 1999 we moved the burn pile, put down black plastic and white rock around buildings and floors so we could see where the rats were working. Feed wagons were raised 3 inches off the floor and enclosed so the rats could be trapped. An old tractor

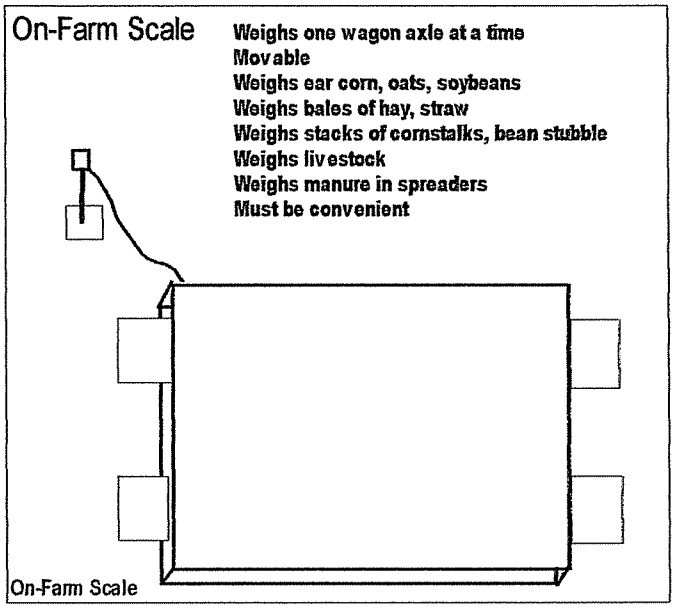


Figure 8-48

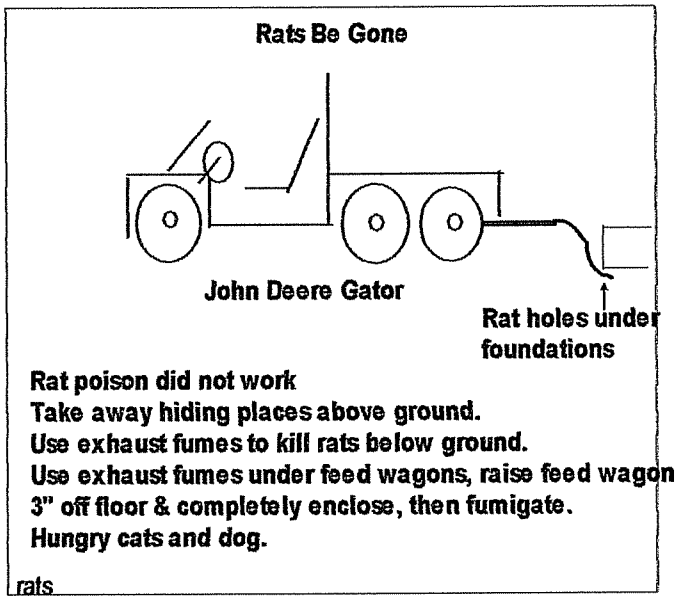


Figure 8-49

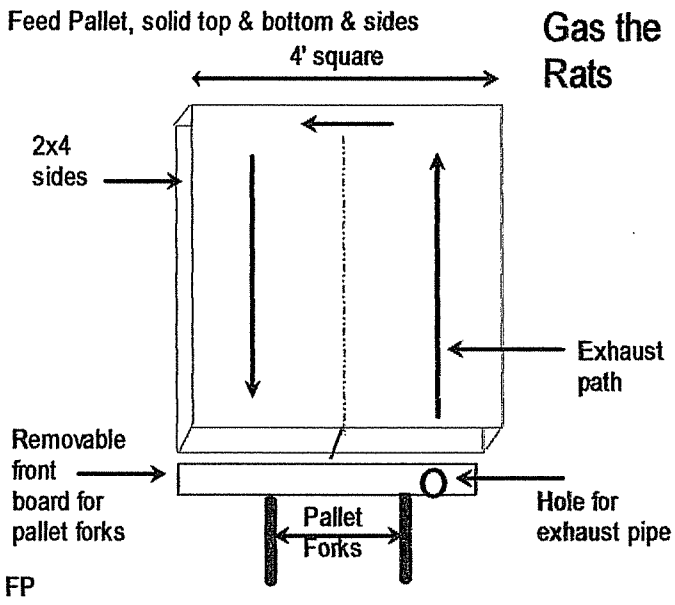


Figure 8-50

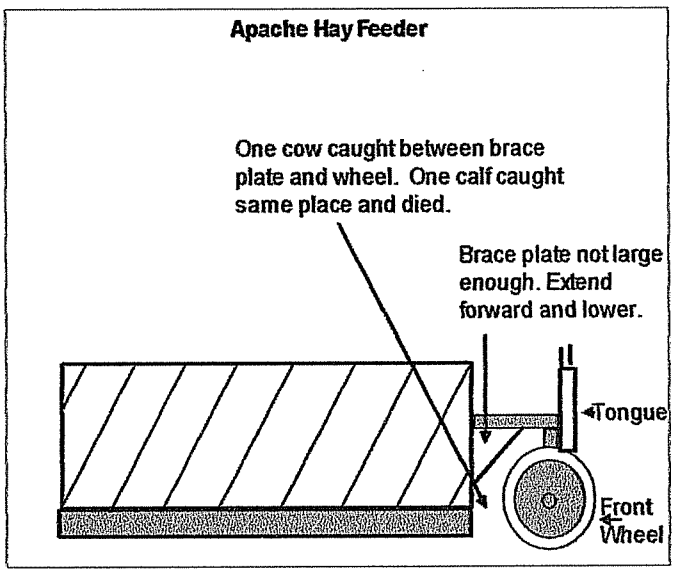


Figure 8-51

umbrella pipe and scrap electrical flex conduit served as the vehicle to get the exhaust from the engine to the rat hole. Our John Deere Gator served as the engine and is easy to get into small places. The umbrella pipe was an exact fit for the Gator muffler **(Figure 8-49). We wonder if the flexible electrical conduit gives us some engine protection since the conduit is not perfectly tight.** A different kind of pallett was made for bagged feed. This pallett has solid floors and sides so that the rats can be gassed **(Figure 8-50).** The rat population has decreased dramatically. Hungry cats and dogs that are good hunters are also an asset.

Apache Hay Feeder

We have purchased a total of seven Apache hay feeders down through the years. They are manufactured at P.O. Box 1247 Norfolk, NE 68702-1247 1-800-345-5073. The last three feeders have an easy removable rear spindle and wheel so that the feeder can be dumped over ot clean out the bottom of the feeder without damaging the wheel or spindle. Grade two bolts hold the spindle in place, they rust and break off. We have replaced these bolts with stainless steed bolt, washer and nut This has been a great improvement. One back corner of the hay feeder is lifted up off the ground with the tractor loader to remove the wheel and spindle. This corner is lowered to the ground making it easier to dump the feeder over on its top.

We have had trouble with cattle getting caught between the front of the feeder and the front wheel on the Apache hay feeder. One cow had her head caught, we had to raise the front of the feeder with the tractor loader to save her. Another time we found a dead calf caught between the feeder and the front wheel. This can be solved by enlarging the brace plate as close to the front wheel as possible **(Figure 8-51).** We prefer to leave the wheel straight for easy hookup.

2008 Update on Apache Hay Feeders

All the Apache Hay Feeders were sold in 2008 at a good resale value. These feeders were always too full when they needed to be dumped over. We made three hay feeders our selves out of 1 1/2" X 1 1/2" square tubing 3/16" thick. One bale hay feeder for the bull/steer fat yard and another for the heifer fat yard metal cost of $591 each at the $2.38 per foot price(Figure 8-52). The metal cost was $756 priced at $2.38 per foot for the three bale cow feeder (Figure 8-53). A new three bale Apache would cost $4660 or more. All three of these feeders were made so that the rear panel could swing open at the bottom by

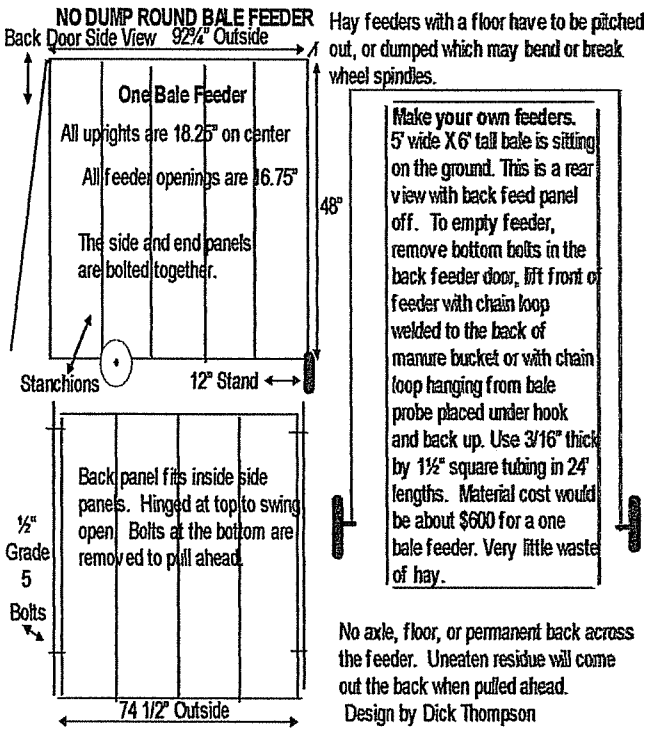


Figure 8-52

removing two bolts for clean out. As of March 1,2009 we have not removed any bolts. The cattle clean up the hay inside and around the outside. We also made a one ton cornstalk feeder for the cows costing $1000 priced at $3.99 per foot(Figure 8-54). All these feeders have a hook on the top that a chain loop on the tractor loader catches the hook so the feeders can be moved without leaving the tractor.

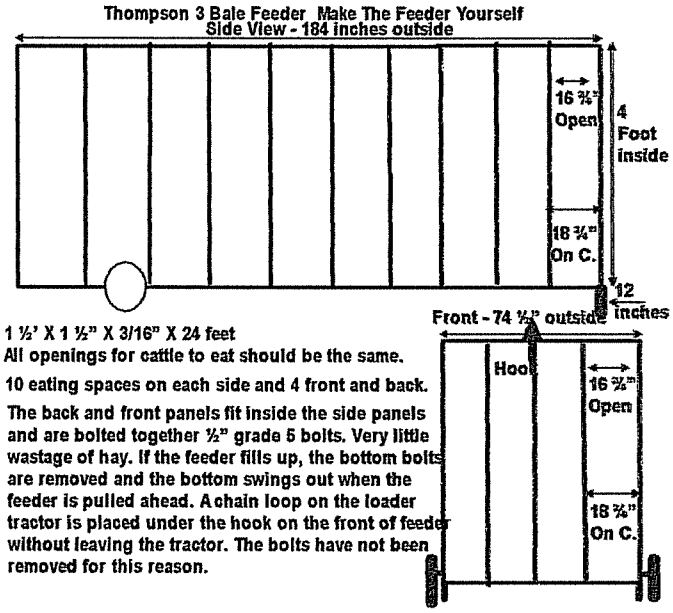


Figure 8-53

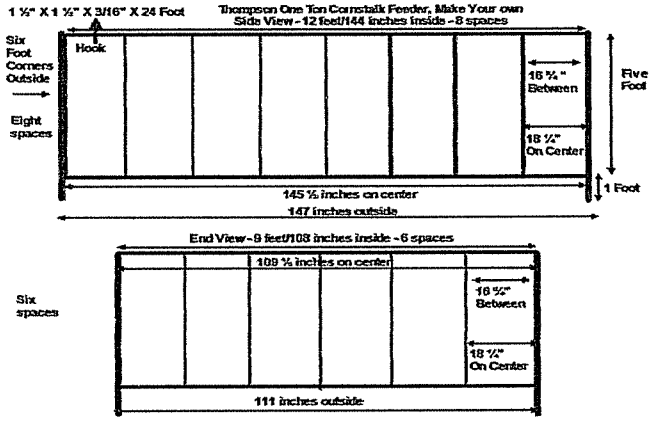


Figure 8-54

Apache Creep Feeder

A two wheel 8 foot 150 bushel creep feeder replaced two old Powder River feeders in 2003. The Powder River feed adjustments were difficult to change. The Apache feed slides are tall and much easier to adjust. When the feeder is about empty the slides are raised clear up and the calves can reach in and clean up every speck of feed. The new Apache feeder has an agitator to help feed flow. The agitator turning lever is on the back of the feeder. Our feeders are backed up tight against a cement walls. **It would be better is our case to have the turning lever on the front side over the hitch. We now have made an agitator lever on the front of all three Apache creep feeders.**

Parasite Examination

	A	B	C	D	E	F
1	Parasite Examination					
2	Thompson RX3 Beef Cows					
3						
4						
5	Cow Number	1994	1995	Parasite type		
6	A 458	Negative	Negative			
7	A 443	Negative	Negative			
8	A 442		Positive	Strongyles		
9				Coccidia		
10	A 395	Negative	Negative			
11	A 385	Negative	Negative			
12	A 375	Negative	Negative			
13	A 359	Negative	Negative			
14	A 337	Negative	Positive	Strongyles		
15	A 93	Positive	Positive	Strongyles		
16	A 2		Positive	Strongyles		
17	B 796	Positive	Negative	Strongyles		
18	B 262	Negative	Negative			
19						
20	Samples not presented in 1995 - Cows were sold					
21						
22	Z 979	Negative				
23	A 161	Positive		Strongyles		
24	A 436	Positive		Strongyles		
25				Coccidia		
26						
27	Comment: Strongyles (stomach-intestinal worms) are only moderate to light infection.					
28	Coccidia are light infestation. Appears to be more cattle with some infestation in 95 than 94.					
29	However, overall the worm load is light and may not be a major performance factor.					
30						
31	Gary Osweiler, DVM		4-8-96			
32						
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Table 8-1

Tel: (515) 232-5661
Fax: (515) 232-5649

Feeder trials

	A	B	C	D	E	F	G	H	I	J	K
1		Soderholm	Smidley								
2	Date trial started	25-Jul-95	25-Jul-95								
3	Number of pigs	49	49								
4	Average starting weight	135	120								
5	Average end weight	262	266								
6	Total pounds gain	6220	7190								
7	Pigs days on feed	3687	3600								
8	Total pounds feed	23618	26366								
9	Gain, pounds per day	1.687	1.9972								
10	Feed per pound gain	3.56	3.67								
11	Dressing percent	73.22	72.12								
12	Backfat (inches)	1.01	0.95								
13	Grade Premium, dollars	1.59	2.93								
14	Sort	-0.72	-0.26								
15	Fat Free Lean Index	47.6	48.1								
16	Skinned Yield	64.85	63.875								
17											
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Table 8-2

137 Lynn Avenue, Suite 200
Ames, Iowa 50014

info@practicalfarmers.org
Web: www.practicalfarmers.org

M W Baler Failures

	A	B	C	D
1	**5600 M&W Baler 5/31/00**			
2				
3	**302 Cornstalk bales in 2000, very dry and windy**			
4	**It seemed like every other bale was a failure**			
5				
6	Date &Crop	Number of bales	Twine wrap failures	Percent failures
7	7/16/01 - Hay	94	15	15.96
8	Oat straw	82	6	7.32
9	9/2/01 - Oat stubble	67	7	10.45
10	9/26/01 - Hay	121	12	9.92
11	SB straw	35	12	34.29
12	Cornstalks	309	25	8.09
13	2001 Total	708	77	10.88
14				
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Table 8-3

Yearly House Heat Inf.

	A	B	C	D	E
1	**Yearly House Heating Information-2940 square feet floor space**				
2	Year	Gallons	Price/gallon	Total cost	Comments
3	1988	824	0.63	520.57	fuel oil, just furnace
4	1989	380	0.82	312.21	fuel oil, just furnace
5	1990	630	0.88	556.35	fuel oil, just furnace
6	1991	413	0.88	365.09	fuel oil, just furnace
7					
8	Average	561.75	0.80	438.56	fuel oil, just furnace
9					
10	1992	955	0.54	517.99	change to LP
11	1993	330	0.57	194.51	LP including clothes dryer
12	1994	800	0.56	445.20	LP including clothes dryer
13	1995	627	0.57	355.57	LP including clothes dryer
14	1996	850	0.62	530.78	LP including clothes dryer
15	1997	845	0.69	583.86	LP including clothes dryer
16	1998	710	0.60	426.41	LP including clothes dryer
17	1999	630	0.58	350.91	LP including clothes dryer
18	2000	510	0.73	364.14	LP including clothes dryer
19	2001	700	0.96	670.08	LP including clothes dryer
20	2002	1011	0.78	784.09	LP including clothes dryer
21	2003	550	0.93	533.06	LP including clothes dryer
22	2004	500	0.95	495.00	LP including clothes dryer
23	2005	575	1.22	702.86	LP including clothes dryer
24	2006	600	1.42	854.26	LP including clothes dryer
25	2007	670	1.51	1013.11	LP including clothes dryer
26	2008	742	2.14	1586.38	LP including clothes dryer
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37	Average	682.65	0.90	612.25	LP including clother dryer
38					
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48					
49					

Table 8-4

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Freezer Beef													
2	Birth Date	Kill Date	Age	Age	Ear Tag	Cow	Carcass.	Live Wt.	Live ADG	Carcass	CWF Wt.	$/#	Cut Out %	$/# CWF
3			(Days)	(Months)		Brand	Weight	C.W.. / .64	(G5-75)/C5	ADG		1.50+.42		
4	Intact Males													
5	08/16/01	01/31/03	534	17.80	82	12	844	1319	2.33	1.58	529	1.92	62.68	3.06
6	09/26/01	01/31/03	492	16.40	83	7	1070	1672	3.25	2.17	628	1.92	58.69	3.27
7	09/26/01	01/31/03	492	16.40	84	44	974	1522	2.94	1.98	614	1.92	63.04	3.05
8	10/12/01	01/31/03	476	15.87	85	32	986	1541	3.08	2.07	547	1.92	55.48	3.46
9	02/24/03	07/19/04	511	17.03	51	32	1020	1594	2.97	2.00	580	1.92	56.86	3.38
10	07/09/03	08/13/04	401	13.37	92	26	890	1391	3.28	2.22	507	1.92	56.97	3.37
11	07/11/03	08/13/04	399	13.30	94	17 17 17	885	1383	3.28	2.22	473	1.92	53.45	3.59
12	05/21/03	08/19/04	456	15.20	67	81	946	1478	3.08	2.07	633	1.92	66.91	2.87
13	05/18/03	09/10/04	481	16.03	62	46	956	1494	2.95	1.99	497	1.92	51.99	3.69
14	05/26/03	09/10/04	473	15.77	70	3 3 3	964	1506	3.03	2.04	519	1.92	53.84	3.57
15	05/14/03	10/11/04	516	17.20	60	68	1030	1609	2.97	2.00	579	1.92	56.21	3.42
16	05/29/03	10/11/04	501	16.70	75	25	1140	1781	3.41	2.28	634	1.92	55.61	3.45
17	10/19/03	12/27/04	435	14.50	103	60	920	1438	3.13	2.11	497	1.92	54.02	3.55
18	11/20/03	02/09/05	447	14.90	112	9 9 9	926	1447	3.07	2.07	463	1.92	50.00	3.84
19	12/03/03	02/09/05	434	14.47	114	11 11 11	1040	1625	3.57	2.40	566	1.92	54.42	3.53
20								0						
21	Average		470	15.66			973	1520	3.09	2.08	551	1.92	56.68	3.41
22								0						
23	Banded Steers							0						
24	06/07/02	07/02/03	390	13.00	5	47	780	1219	2.93	2.00	447	1.92	57.31	3.35
25	07/23/02	07/02/03	344	11.47	21	73	785	1227	3.35	2.28	475	1.92	60.51	3.17
26	05/25/02	08/13/03	445	14.83	93	53	862	1347	2.86	1.94	476	1.92	55.22	3.48
27	06/20/02	08/13/03	419	13.97	14	12	790	1234	2.77	1.89	392	1.92	49.62	3.87
28	08/24/02	02/04/04	529	17.63	24	26	815	1273	2.27	1.54	418	1.92	51.29	3.74
29	09/27/02	02/04/04	495	16.50	27	21 21 21	860	1344	2.56	1.74	444	1.92	51.63	3.72
30	11/19/02	02/20/04	458	15.27	39	60	896	1400	2.89	1.96	536	1.92	59.82	3.21
31	10/09/02	04/02/04	541	18.03	29	11 11 11	840	1313	2.29	1.55	460	1.92	54.76	3.51
32	10/13/02	04/02/04	537	17.90	30	61	935	1461	2.58	1.74	477	1.92	51.02	3.76
33	10/19/02	05/10/04	569	18.97	33	9 9 9	1000	1563	2.61	1.76	503	1.92	50.30	3.82
34	06/20/03	11/26/04	525	17.50	85	62	910	1422	2.57	1.73				
35	05/05/03	11/26/04	571	19.03	57	57	915	1430	2.37	1.60				
36	Average		485	16.18			866	1353	2.67	1.78	463	1.92	54.15	3.56
37								0						
38								0						

Table 8-5

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SWINE BREEDING SCHEDULE.xls

	A	B	C	D	E	F	G	H
1	BREEDING		FOUR WEEKS	SIX WEEKS		FOUR WEEKS	SIX WEEKS	
2	DATES	FARROW	LEAVE ISOLIT	WEAN - REBREED	FARROW	LEAVE ISOLIT	WEAN	ISOLIT EMPTY
3								
4	NOV15-Dec15	MAR8-APR7	APR8-MAY7	APR22-MAY21	AUG12-SEP11	SEP12-OCT11	SEP26-OCT25	JUNE7-AUG12
5								
6	DEC15-JAN15	APR7-MAY8	MAY7-JUNE7	MAY21-JUNE21	SEP11-OCT12	OCT11-NOV12	OCT25-NOV26	NOV12-MAR8
7								
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12								

Table 8-6

Sow Ration - 2007.xls

	A	B	C	D	E	F	G	H
1	Sow Ration - 2007							
2	Ingredients	Gestation	Lactation					
3	Pre Mix	100	100					
4	SBM	250	350					
5	Oats	450	400					
6	Ground Ear Corn	1200	800					
7	Shelled Corn		350					
8	Total Pounds	2000	2000					
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Table 8-7

BLANK PAGE FOR NOTES

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