

Best Management Practice Considerations for Cows in Confinement

**Ron Lemenager, PhD, PAS
Purdue Animal Science**

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Preface

- **Conventional production system**
 - Grazing during the growing season
 - Harvested feeds during winter
 - Hay, ensiled crops
 - Supplements
 - Emphasis on extending grazing season
 - Stockpiled forage
 - Crop residues
 - Cover crops

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Cows in Confinement

- **Not a new concept**
 - Traps, pasture sacrifice areas, drylots, semi-drylots, feedlots
- **Timing**
 - When grazing could damage the forage crop
 - Drought, snow cover, mud
 - When cows need close observation
 - Calving, breeding

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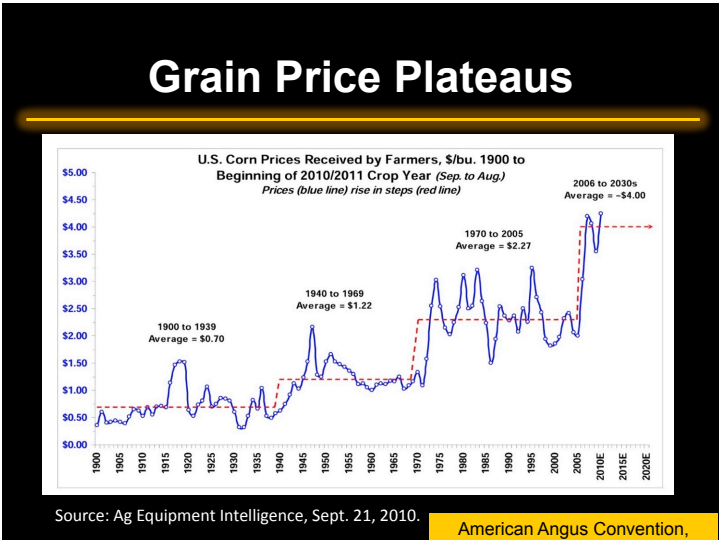
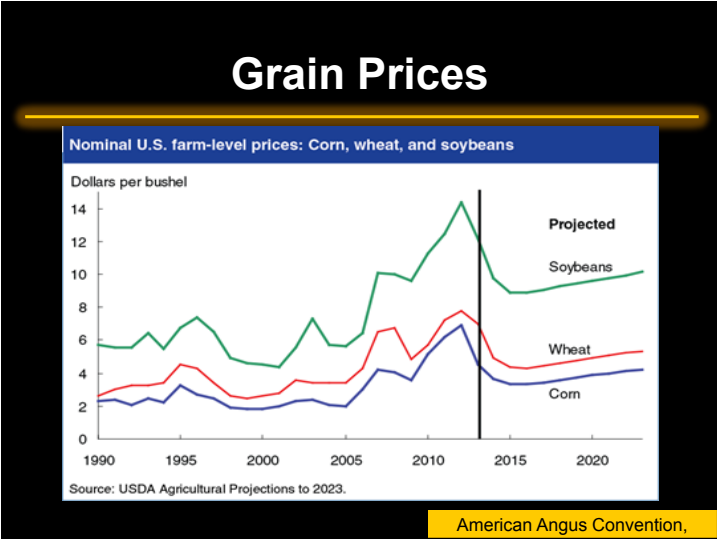
Cows in Confinement

- **Growing interest**
 1. Reduce land dedicated to forage production
 2. Use cropland in double duty (grain, forage)
 3. Use locally available, economic feeds
 - Industry byproducts
 - Crop residues
 4. Cow herd expansion
 5. Bring in additional family members
- **Opportunities**
 - Nutrient utilization, labor efficiency, feed cost, unit cost of production

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Background

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Cropland and Pasture Values

State	Crop land, \$/a ('00 vs:'15)		Pasture land, \$/a ('00 vs:'15)	
Illinois	2350	7650	1000	3550
Indiana	2250	7000	1400	2600
Iowa	1940	8200	700	3400
Kentucky	1800	3720	1380	2750
Michigan	1820	4550	1150	2680
Minnesota	1280	4750	475	1900
Missouri	1300	3810	840	1950
Nebraska	1130	5070	230	870
North Dakota	440	2140	155	850
Ohio	2400	5850	1600	3140
South Dakota	545	3730	190	980
Wisconsin	1600	4600	825	2500
Mean	1571	5089	829	2264
		+224%		+173%

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Calving Season

- Ideal time depends on:
 - Environment
 - Availability of feeds
 - Intended target market
 - Labor accessibility
- 60% in spring (Feb-Apr)
 - Minimize impact of summer heat (calving/breeding)
 - Availability of forages to support lactation
- 15% in fall (Sep-Nov)
- 25% year round

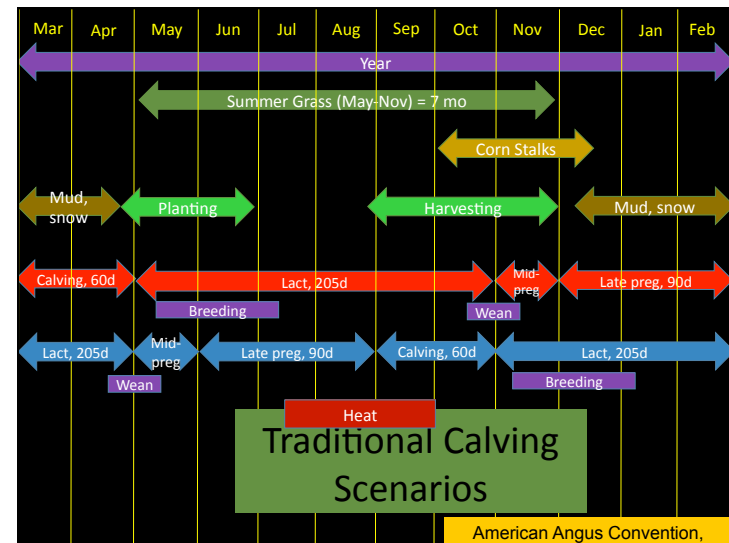
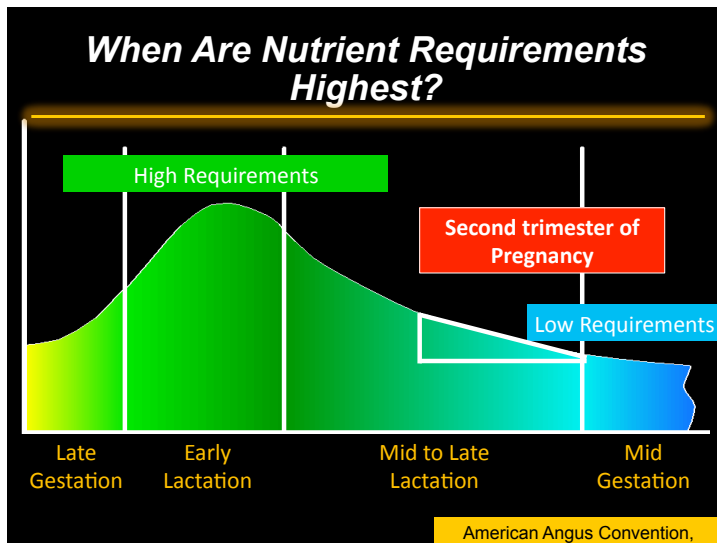
USDA, 2009

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Calving/Breeding in Confinement

- Many cow-calf operations have cropland?
- When is labor available?
- Is environment still an issue?
- Where are seasonal high cattle prices?

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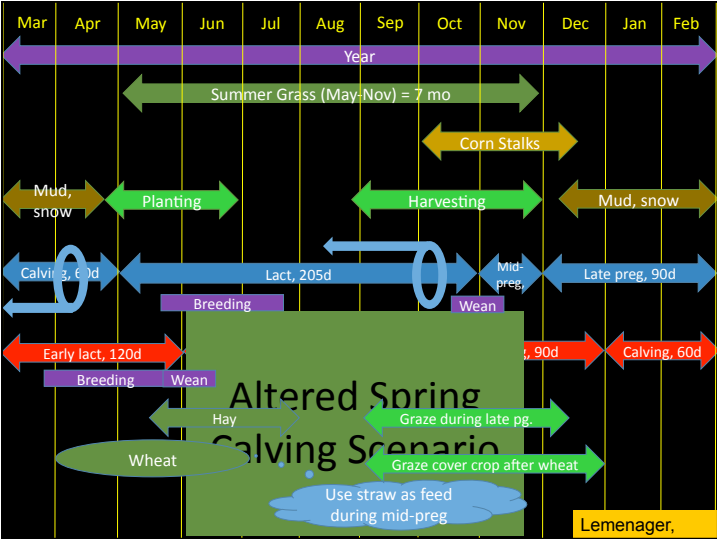


Spring Calving Scenario (traditional)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Choice Steers (IA-So. MN)												
Seasonal Price Index	97	98	101	101	100	97	98	99	101	101	103	103
Variability	20.6	21.7	22.7	21.6	21.3	22.7	24.5	24.0	24.1	26.5	27.8	26.8
700-800 lb. Steers (Iowa)												
Seasonal Price Index	93	94	95	97	98	101	103	104	105	104	104	103
Variability	27.0	26.8	27.3	25.9	27.5	30.8	34.5	35.3	39.0	44.3	43.9	43.9
500-600 lb. Steers (Iowa)												
Seasonal Price Index	95	98	101	101	101	100	99	101	99	99	103	103
Variability	34.3	33.0	34.8	32.7	33.4	38.8	42.9	45.5	44.7	51.9	57.7	56.9
Utility Cows (Sioux Falls)												
Seasonal Price Index	91	98	101	102	105	103	103	105	102	99	94	95
Variability	13.1	14.8	16.9	16.7	15.6	17.4	18.8	20.8	20.0	20.5	21.6	21.1

Source: Iowa State

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Spring Calving Scenario (alternative)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Choice Steers (IA-So. MN)												
Seasonal Price Index	97	98	101	101	100	97	98	99	101	101	103	103
Variability	20.6	21.7	22.7	21.6	21.3	22.7	24.5	24.0	24.1	26.5	27.8	26.8
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Source: Iowa State

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Best Management Practices

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Typical Age Distribution

- **15-20% average culling rate**
 - **Potential replacement heifers**
 - Develop ~ 25% of calving cow number
 - ~ 20% 1st calf heifers
 - ~ 17% 2nd calf heifers
 - ~ 60% mature cows
- **Opportunity to manage nutritional groups**
 - Reduce feed cost
 - Avoid over/under feeding
 - Developmental (fetal/lactational) programming

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Herd Health

- **Balanced diets**
- **Management of environmental stresses**
 - Hot, humid
 - Cold, wind
 - Rain, mud
- **Cons of confinement**
 - Potential to concentrate disease organisms

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Herd Health

- **Mitigation**
 - Easy observation
 - Sickness
 - Calving
 - Breeding
 - Easy to move and handle
 - Clean, dry bedding
 - Sound vaccination strategy
 - IBR, PI₃, BVD, BRSV, 5-way Lepto (maybe others)
 - 7-way clostridia
 - Scours (E.coli, Rota-Corona virus)
 - Maybe (Pasteurella, Haemophilus)
 - Deworm
 - Calf colostrum

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Value of Bedding-Pack Nutrients

- **Anderson (2007) – North Dakota**
 - More fertilizer value in bedding-pack than manure
 - Less ammonia volatilization



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Bedding

- **Corn stalks for cows – producer experience**
 - Absorbent
 - Easier to bed
 - Easier to clean pens
- **Straws and low quality forages**
 - Absorbent
 - Harder to bed
 - Harder to clean pens
- ~ 1 LRB EOD in winter for 60 cows
- ~2 LRB ED in winter for 128 heifers

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Environmental Concerns

- Each state has rules and regulations
- **Confinement (CAFO) can be defined**
 - By animal numbers
 - A defined period with < 50% vegetation
 - An environmental violation
- May require an nutrient management plan
- May require permits


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<i>Outside</i>	<i>vs.</i>	<i>Inside</i>
<ul style="list-style-type: none"> • <i>Manure spread by cow</i> • <i>Soil Compaction</i> • <i>Riparian areas</i> • <i>Animal observation</i> • <i>Acc. to handling facil.</i> • <i>Ice and snow</i> • <i>Rough frozen ground</i> • <i>Frost bite</i> 		<ul style="list-style-type: none"> • <i>Bed, scape and haul</i> • <i>Minimized</i> • <i>Minimized</i> • <i>Easy</i> • <i>Easy</i> • <i>Minimized</i> • <i>Minimized</i> • <i>Minimized</i>

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Energy Requirements

- **For each 10° F drop in wind chill below 30° F**
Energy requirements increase:
 - 13% for moderate condition cows with a dry, winter haircoat
 - 30% for cows that are thin, wet, or have a summer hair coat



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Outside vs. Inside

• Activity	• Reduced
• Cold stress	• Reduced
• Birth weight	• Reduced
• Dystocia	• Reduced
• Hypothermia	• Reduced
• Colostrum absorption	• Increased
• Mud	• Minimized
• Energy Requirements	• Reduced ~30%

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Key Facility Considerations

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Ventilation in Confinement

- **Respiratory challenges**
 - **Humidity**
 - **Gasses (ammonia)**
- **Mitigation (potential for moisture condensation)**
 - **Ridge vents**
 - **Monoslope roof design**
 - **Eliminates air flow restrictions**
 - **Heat and moisture rise**
 - **Air movement over the cattle, not on the cattle**
 - **Increased solar radiation into bldg. – winter**
 - **Reduced heat load in bldg. - summer**

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Bunk Space Recommendations

- **Based primarily on animal size and diet**
 - **500-700 calves on grower diet**
 - **12-18 inches**
 - **Mid-gestation cows**
 - **24 inches**
 - **Late pregnant cows**
 - **30 inches**
 - **Lactating cows**
 - **Up to 40 inches**
- **Bunks on 2 sides of pen?**

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Bunk Capacity Considerations

- Capacity is based on bunk dimensions
 - Throat height
 - Bottom width
 - Feed alley height and amount of flare
- Calves
 - 12" throat height (max. 18")
 - Bottom width (max. 24")
 - False bottom?
- Cows (high capacity)
 - Throat height (~22")
 - Bottom width (~30")

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Calf Behavior

- Calves in feed bunk **increase when:**
 - Pens are not maintained (looking for a dry place)
 - Pens are crowded (looking for a quiet place)
 - Inadequate bunk space (cows pushing calves)

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Animal Space Recommendations

- Outside lots (cow-calf pair)
 - 350 sq ft in a dry environment
 - Up to 800 sq ft in a cold wet environment
- Inside only (cow-calf pair)
 - Small cows (mimimum of 85-90 sq. ft.)
 - Large cows (≥ 120 sq. ft.)
 - 100 for cow + 20 for calf
 - Allows some change in animal density

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Pen Configuration

- Pen length and width **dependent on:**
 - Animal numbers
 - Equipment to be used
- Tractor + bale processor to bed pens
 - 80' allows driving in a circle
- **Smaller equipment, different bedding strategy**
 - Smaller pens could be justified

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Pen Numbers

- **Based on how building will be used**
- **From a nutritional view**
 - **5 - 6 pens for the cow herd has some logic**
 - **Ex. 100 cow herd**
 1. 25 replacement heifers
 2. 25 1st calf heifers + thin 2nd calf heifers
 3. 25 2nd calf heifers + thin mature cows
 4. 25 mature cows
 5. 25 mature cows

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Calving Behavior

- **Cows like to isolate themselves**
- **Placental fluids and membranes**
 - Allow cows to initially identify calf
- **Cows in tight confinement get confused**
 - Too many smells from other cows calving
 - 1st calf heifers can be more confused
 - Not claim their calf
 - Claim another cow's calf

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Handling Facilities

- **Designated pen for calving**
 - Allows easier observation (feed alley in vehicle)
 - Calving cameras are an option (cell phone access)
 - Allows more space for calving cows and newborns
 - Individual calving pens (min. 10'x12')
 - Can use portable corral panels
 - Can attach to pen divider, or feed bunk
 - Allows pairs to bond
- **Drover's alley connecting pens to handling**
 - 12' is a magic width
 - Can be the 12' apron along the feed bunk
 - Can use the feed alley in double duty

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Other Considerations

- **Are some genetic lines more adaptable to confinement than others?**

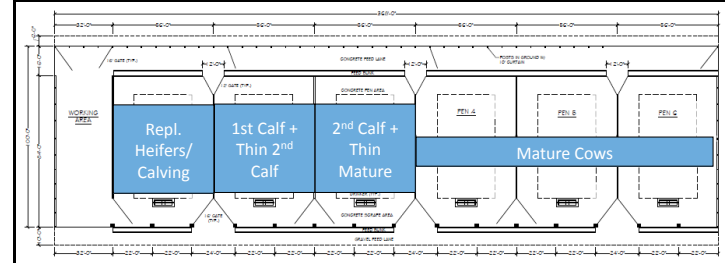
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Creep Feeding

- Potential for lower WWt in confinement
- Creep feeding/early weaning justified?
 - Calf performance
 - Unit cost of production (\$/lb calf weaned)
 - Calf injuries

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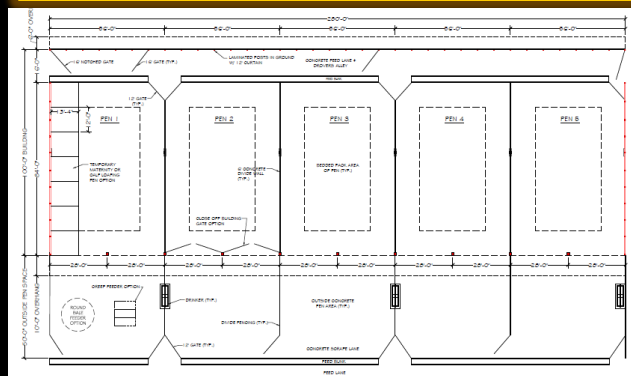
240 Pair - Indoor



118 ft²/pair, 29" bunk/pair

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200 Pair – Indoor/Outdoor



118(188) ft²/pair, 29" bunk

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Herd Management Summary

- **Intensified management**
 - Nutrition and feeding
 - Herd health
 - Creep feeding/Early weaning
 - Bedding/Manure management
- **Reduced maintenance energy requirement**
- **Nutritional grouping**

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Facility Summary

- **24 – 40 “ bunk/cow**
- **≥ 120 ft²/pair**
- **Designated calving pen(s)**
- **Creep feeding/early weaning**
- **Manure storage and handling**
- **Ventilation**
- **Animal observation and handling**

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Questions/Discussion



Ron Lemenager
rpl@purdue.edu
765-427-5972

55 page white paper
<http://info.summitlivestock.com/cow-calf-package>

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Cow-calf Feasibility Worksheet

- **10 Key Factors (Moe Russell)**
 - Cow longevity
 - Feed/pasture cost
 - Calf weaning weight
 - Manure value
 - Improved conception rate
 - Estrous sync and AI opportunity
 - Shifting calving season/higher seasonal prices
 - Calf mortality
 - Cow salvage value

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