

# *“Economics of Grass-Fed Livestock Systems in Maryland”*

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What is Management Intensive Grazing (MIG)?

Profitability of MIG versus Confinement Dairies  
(with Dale Johnson, Erik Lichtenberg, and Kota Minegishi)

Willingness to pay by Consumers for Grass-fed  
(MIG) Beef (with Charles Towe, Aaron Adalja, and  
Elina Tselepidakis)



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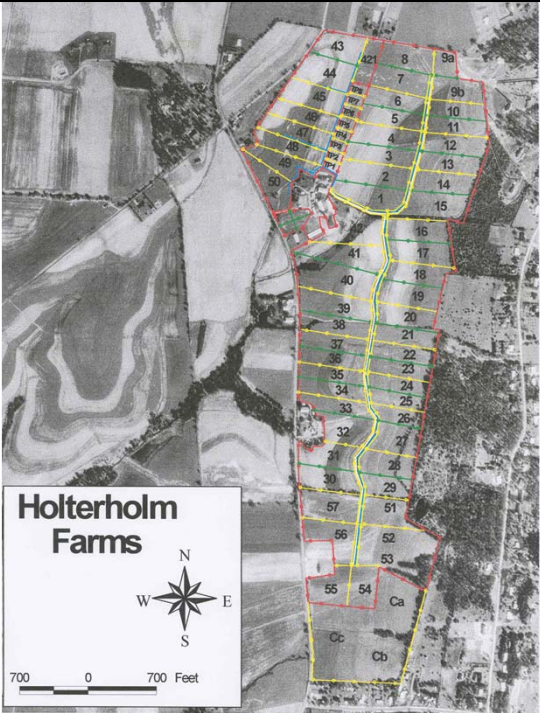
## What is Management Intensive Grazing?

- Grazing system where the livestock are moved 'frequently' to fresh, rested pastures so as to maximize quality and quantity of forage growth
- Instead of one big pasture, pasture is divided into many smaller paddocks.
- In MIG, machinery and human labor are largely replaced by livestock that harvest the feed and spread the manure



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**Holterholm Farms**

**Management Intensive Grazing (MIG)**

Holterholm Farm

- 100+ milking cows
- Sixty paddocks
- Three-acres per paddock
- 100 cows per paddock, changed every 12 hours
- Jersey cross-breeds – better grazers

MIG Requirements

- Contiguous pastures
- Cows able to walk in and out – twice per day
- 'Heavy use' geotextile lanes
- Water sources
- Grass is the main crop & principal source of nutrients
- Mix of permanent and temporary fencing (solar powered)



**High-producing Holsteins  
for confinement dairies**



**Jersey cross-breeds are  
better grazers and yield  
higher milk components**

## Profitability of MIG versus Confinement Dairies

### *The Maryland Dairy Situation*

|                      | <u>2007</u>   | <u>1982</u>   | <u>%</u> |
|----------------------|---------------|---------------|----------|
| Cows                 | 58,000        | 122,000       | -52%     |
| Dairy Farms          | 661           | 1,785         | -63%     |
| Cows/farm            | 88            | 68            | 28%      |
| Milk Yield (lbs)/cow | 18,017        | 12,959        | 39%      |
| Total Milk (lbs)     | 1,044,986,000 | 1,580,998,000 | -34%     |



## Source of Dairy Data: Dale Johnson's Extension Program

| Costs per Cow           | Your Farm | Average 29 Farms | Highest 10 Farms | Lowest 10 Farms |
|-------------------------|-----------|------------------|------------------|-----------------|
| 13 Custom hire          | 150       | 154              | 141              | 192             |
| 14 Depreciation         | 552       | 327              | 329              | 351             |
| 15 Employee benefits    | 0         | 19               | 6                | 32              |
| 16 Feed                 | 187       | 1,213            | 931              | 1,677           |
| 17 Fertilizer and lime  | 169       | 188              | 237              | 132             |
| 18 Freight and trucking | 27        | 185              | 180              | 183             |

Farmers compare their Schedule F returns to other dairy farms

*Green is good (low expense/cow),*

*Red is cause for concern (high expense/cow)*

## PER FARM

Schedule F Tax Returns, 1995 to 2009, <200 Cows

|                              | <u>MIG</u>     | <u>Confinement</u> |
|------------------------------|----------------|--------------------|
| Number of Cows/Farm          | 86             | 103                |
| Farm Acreage                 | 283            | 318                |
| <b>Milk Production (cwt)</b> | <b>11,908</b>  | <b>19,727</b>      |
| Pasture Acres/Cow            | 1.8            | 0.5                |
| Crop Acres/Cow               | 1.6            | 2.7                |
| <b>Gross Income (\$)</b>     | <b>260,298</b> | <b>414,048</b>     |
| <b>Total Expenses (\$)</b>   | <b>206,914</b> | <b>366,221</b>     |
| <b>Net Profit (\$)</b>       | <b>53,383</b>  | <b>47,826</b>      |
| Number of Farms              | 19             | 48                 |



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## PER COW

|                                  | <u>MIG</u> | <u>Confinement</u> |
|----------------------------------|------------|--------------------|
| Cattle Sales (\$/cow)            | 240        | 206                |
| Purchased Feed (\$/cow)          | 809        | 1,045              |
| Hired Labor (\$/cow)             | 66         | 193                |
| Vet, Breeding & Medicine(\$/cow) | 81         | 179                |
| Net Profit (\$/cow)              | 636        | 464                |

## PER CWT

|                                   | <u>MIG</u> | <u>Confinement</u> |
|-----------------------------------|------------|--------------------|
| Cattle Sales (\$/cwt)             | 1.85       | 1.10               |
| Purchased Feed (\$/cwt)           | 5.78       | 5.62               |
| Hired Labor (\$/cwt)              | 0.50       | 1.03               |
| Vet, Breeding & Medicine (\$/cwt) | 0.53       | 0.94               |
| Net Profit (\$/cwt)               | 4.75       | 2.45               |

## Conclusions

### Factors Favoring MIG

- Less income, even less expenses, more profits (cow and CWT)
- Less risky
- Easier entry for beginning farmers
- Healthier animals
- Less labor
- Easier transition to organic milk production

### Factors Favoring Confinement

- MIG has more difficult land requirements (contiguous, water)
- Easier to add additional crop land to farming operation than pasture land
- Land is expensive in the Mid-Atlantic
- Greater opportunities for herd expansion

## 'Willingness to Pay' for Grass-Fed Beef

'Willingness to Pay' – an accepted economic analysis used to estimate the values of different attributes of a given commodity.

In this study, we estimate 'Willingness to Pay' for

- Locally produced beef vs. domestically (U.S.) produced beef
- Grass-fed beef vs. conventionally produced beef



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## Data Description

### *Hypothetical*


- **Food buying club in Maryland (Fall 2011)**
  - Experience and explicit interest in purchasing local/grass-fed
  - Email solicitation using Listserv with ~1,200 addresses
  - Online survey
- **General population of Maryland (Fall 2011)**
  - Random sample of residents recruited by web survey company
  - Baseline comparison for buying club
  - Identical online survey

### *Non-Hypothetical*

- **Shoppers in suburban Maryland supermarket (Fall 2012)**
  - Midsize, regional grocery chain in Baltimore suburb
  - Shortened survey instrument
  - Financial support by the Jorgensen Family Foundation

12

### Non-Hypothetical - Grocery Store near Baltimore


Exit Survey

#### Ground Beef Gift (HEADS)

29%


2. I prefer this gift option most:

Gift A     
  Gift B     
  Gift C

| GIFT A  | GIFT B  | GIFT C   |
|---|---|--|
| <b>One Pound Of:</b><br>90% Lean or Greater<br>Ground Beef<br>Domestic (U.S.) | <b>One Pound Of:</b><br>90% Lean or Greater<br>Grass-Fed Ground Beef<br>Domestic (U.S.) | NO<br>Ground Beef  |
| <b>AND</b>  |   |  |
| <b>A Coupon For:</b><br>\$4.50<br>Off Today's Grocery Bill                    | <b>A Coupon For:</b><br>\$2.50<br>Off Today's Grocery Bill                              | <b>A Coupon For:</b><br>\$4.75<br>Off Today's Grocery Bill |

12 profiles = two types of production, two distances traveled, and 3 prices (\$0.50, \$2.50, and \$4.50). 'No ground beef' is always \$0.25 more than the highest alternative.

### Non-Hypothetical - Grocery Store near Baltimore


Exit Survey

#### Ground Beef Gift (TAILS)


36%

4. I prefer this gift option most:

Gift A     
  Gift B     
  Gift C


| GIFT A  | GIFT B  | GIFT C   |
|---|---|--|
| <b>One Pound Of:</b><br>90% Lean or Greater<br>Ground Beef<br>Raised Within 100 Miles | <b>One Pound Of:</b><br>90% Lean or Greater<br>Grass-Fed Ground Beef<br>Domestic (U.S.) | NO<br>Ground Beef  |
| <b>AND</b>  |   |  |
| <b>A Coupon For:</b><br>\$2.50<br>Off Today's Grocery Bill                            | <b>A Coupon For:</b><br>\$4.50<br>Off Today's Grocery Bill                              | <b>A Coupon For:</b><br>\$4.75<br>Off Today's Grocery Bill |

| <u>Attribute</u> | <u>Hypothetical</u>                    |   | <u>Non-Hypothetical</u><br><u>Non-Specialty</u><br><u>Supermarket</u> |
|------------------|--|---|---|
|                  | <u>Grass-fed</u><br><u>Buying Club</u> | <u>Survey Service</u><br><u>MD Population</u> |   |
| Local Beef       | \$0.95                                 | \$1.62  | \$1.87  |


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| Local Beef       | \$0.95                                 | \$1.62  | \$1.87  |
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| <u>Attribute</u>     | <u>Hypothetical</u>                    |   | <u>Non-</u>   |
|----------------------|--|---|---|
|                      | <u>Grass-fed</u><br><u>Buying Club</u> | <u>Survey Service</u><br><u>MD Population</u> | <u>Hypothetical</u><br><u>Non-Specialty</u><br><u>Supermarket</u> |
| Local Beef           | \$0.95                                 | \$1.62  | \$1.87  |
| Grass-Fed            | \$2.65                                 | \$1.63  | \$1.26  |
| Interaction          |  |   |   |
| Coefficient          | +                                      | -   | -   |
| Local &<br>Grass-Fed | >\$3.60                                | < \$3.25                                      | <\$3.13   |



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## An Educational and/or Marketing Campaign is Needed

Maryland grass-fed beef producers will benefit financially by educating their consumers, e.g., consumers will pay more by understanding that:

- Local beef is a geographic distinction
- Grass-fed is a different production method for raising beef
- Grass-fed beef is 'healthier' for consumers than conventionally produced beef

*Grass-fed goes to how beef was produced and local goes to its source*



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