

# Educating Producers and Students Using iGENDEC

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# Opportunities for Educational Ideas

Facilitates education on the power of index selection



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graph TD; A[Facilitates education on the power of index selection] --> B[Reinforces targeted selection for Economically Relevant Traits]; B --> C[Illustrates the proper weighting for trait selection in various management/marketing environments];
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Reinforces targeted selection for Economically Relevant Traits

Illustrates the proper weighting for trait selection in various management/marketing environments

# Example: Undergraduate Homework

Set up a  
“model” herd in  
Stocket

Could use any records keeping software that students have access to

Alternatively, provide a written description of the herd focusing on providing the necessary information to feed into iGENDEC

Allow flexibility  
for students to  
use their brains  
and make some  
assumptions

Don't provide market prices, let them research and set those

Conception rates and calf loss information are good candidates for assumptions

# Example: Undergraduate Homework



**Provide two scenarios with differing input levels – all other inputs the same**

This will be the data that goes into Herd Costs Per Animal

- Good nutrient management - \$500
- Poor nutrient management - \$800



**Students input data into iGENDEC for each scenario and generate indexes**

Print pdf of index values and graphs showing trait weights



**Instructed to write a description of observations of differences between the two indexes**

# Logistics

Students can get access to iGENDEC with a guest account

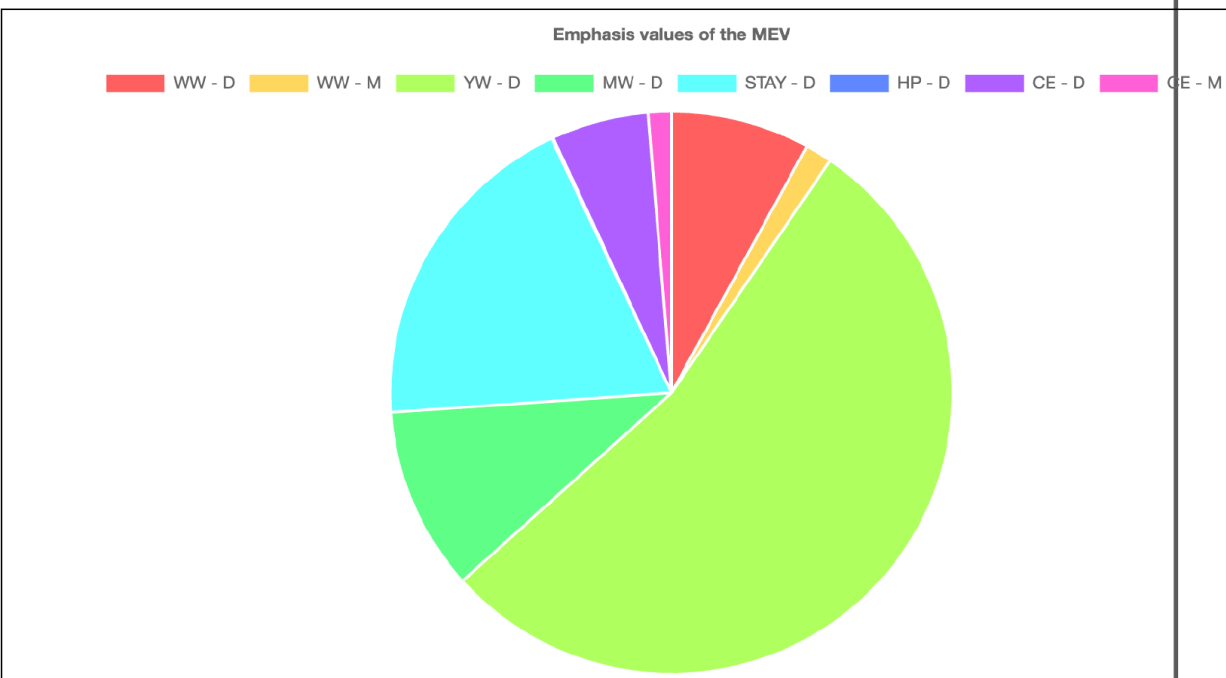
- Please discuss with Dr. Spangler before turning loose 100 students with a 3-day deadline
- Every account must be approved and too many runs at the same time could overwhelm the system

Basic herd information like cow age distribution are critical

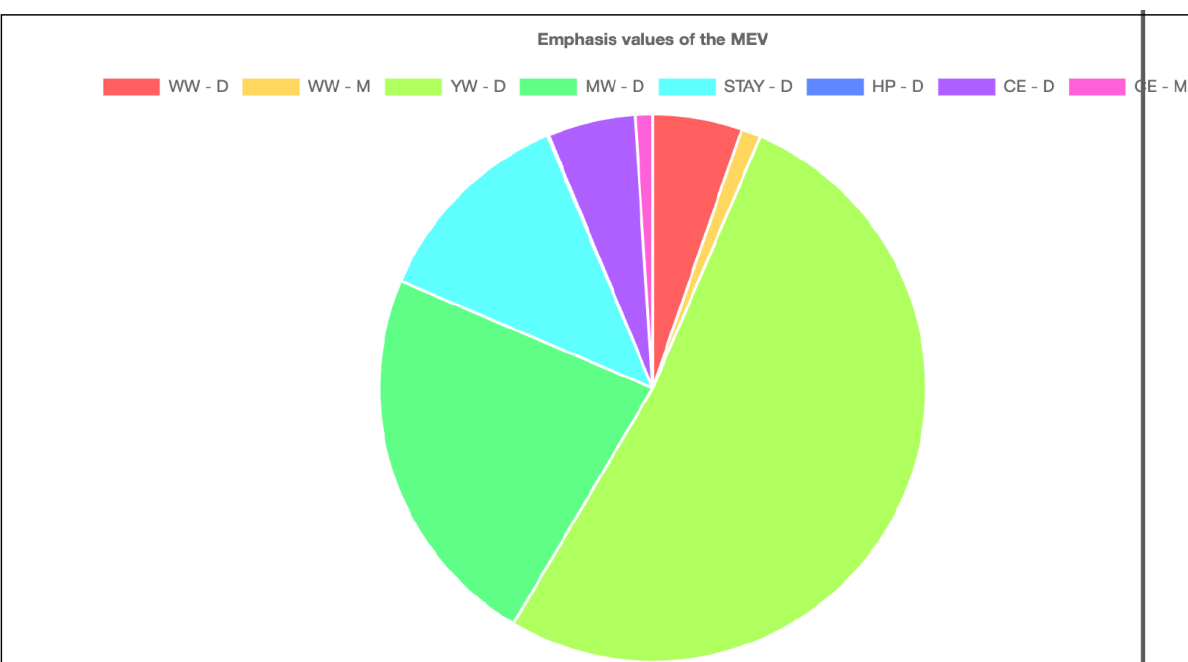
- Other base information like Conception Rate and Calving Loss Rate can be handled with reasonable assumptions

# Example of Desirable Result!

## High Nutrition



## Low Nutrition



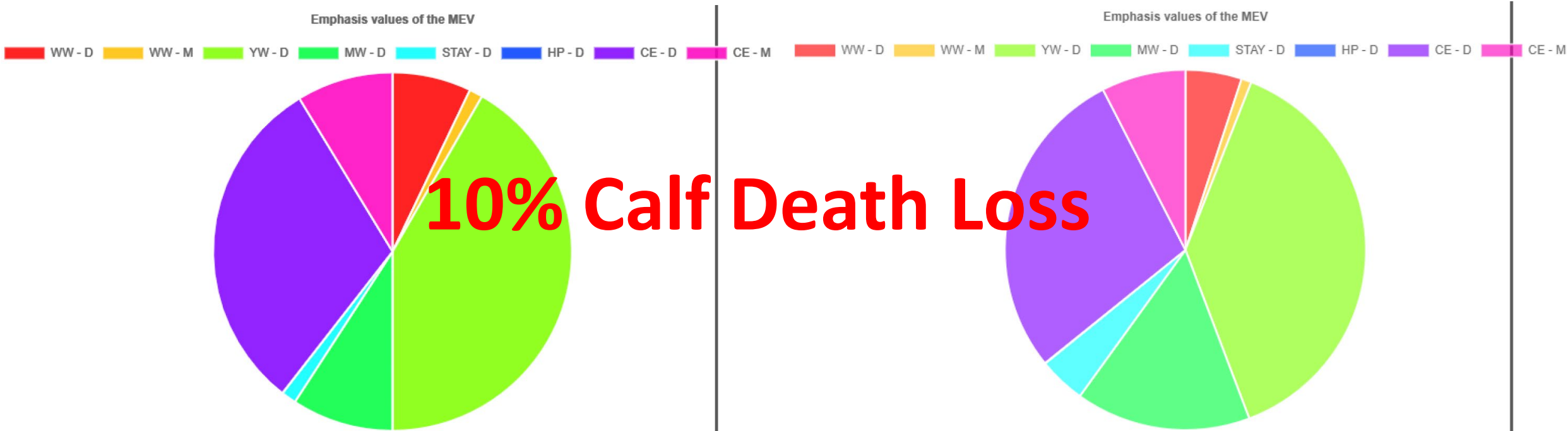
MW	Direct	-0.071
WW	Maternal	0.063
STAY	Direct	2.066

MW	Direct	-0.158
WW	Maternal	0.049
STAY	Direct	1.370

# Example of Undesirable Result!

High Nutrition

Low Nutrition



Category	High Nutrition	Low Nutrition
CE	18.607	18.448
CE	8.213	7.700

Category	High Nutrition	Low Nutrition
CE	18.607	18.448
CE	8.213	7.700

Comment:

Angus/Hereford cows with a matching calf crop, looking for purebred Simmental bull, 9 year age range of cows, sale prices based off current USDA market in Kentucky for the last week, cost of \$500 per year for cow feed and \$30 per month for backgrounding, average mcw was 1400.75 lbs, average ww was 523.4 lbs.

Results

Values Graph

Trait	Component	Marginal Economic Value
BW	Direct	-0.258
WW	Direct	0.712
WW	Maternal	0.139
YW	Direct	0.415
MW	Direct	-0.143
STAY	Direct	-0.035
HP	Direct	0.239
CE	Direct	2.019
CE	Maternal	1.118

Index Component Selection

Use	Component	?
<input type="checkbox"/>	USREA,D	?
<input type="checkbox"/>	USIMF,D	?
<input type="checkbox"/>	USFAT,D	?
<input type="checkbox"/>	HCW,D	?
<input type="checkbox"/>	REA,D	?
<input type="checkbox"/>	FAT,D	?
<input type="checkbox"/>	MS,D	?
<input type="checkbox"/>	BW,D	?
<input checked="" type="checkbox"/>	WW,D	?
<input checked="" type="checkbox"/>	WW,M	?
<input checked="" type="checkbox"/>	YW,D	?
<input type="checkbox"/>	FI,D	?
<input checked="" type="checkbox"/>	MW,D	?
<input checked="" type="checkbox"/>	STAY,D	?
<input checked="" type="checkbox"/>	HP,D	?
<input checked="" type="checkbox"/>	CE,D	?
<input checked="" type="checkbox"/>	CE,M	?



# What WE Learned

Students did not understand selection indexes and other basics of genetic selection

- “The higher quality diet also focused less on mature weight, showing a better diet helps create a larger mature weight while a poor diet has to rely much more on genetics”

Allowing students to make assumptions is a valuable (scary) learning experience for both instructor and students

Generationally ingrained concepts are hard to change

iGENDEC is a user-friendly tool, but this emphasizes the need for a good knowledge of genetics to fully utilize its capabilities

# UNIVERSITY OF KENTUCKY BULL VALUE ASSESSMENT PROGRAM

**Angus**  
**Hereford**  
**Simmental**  
**SimAngus**



## Example: Extension Program

- Two-part education
  - Session 1 – basics of bull selection including crossbreeding and selection tools
    - Provide each participant with a management/marketing scenario
    - Provide each participant with a sales catalogue
  - Task participants with studying the materials with the goal of buying the best valued bull possible within their constraints

# Example: Extension Program

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- Session 2 – Mock auction
  - Sell all bulls with live auctioneer
    - No limit with understanding that the goal is the best valued bull
    - Set floor and have “planted” bidders
  - After sale discussion
    - Go through each scenario discussing impact of heterosis and Economic Relevant Traits
    - Show ranking of how bulls fit that scenario
    - Identify the high value purchase for each scenario

# Example: Scenario 1

$\frac{3}{4}$  Angus  $\frac{1}{4}$  Gelbvieh

1400 lb cows, heavy  
milking ability

Spring calving, pre-  
condition sale 60  
days post-weaning

Will breed 25  
mature cows

Replacements  
retained

Poor forage/hay  
program with  
minimal  
supplementation

Full time off-farm  
job

Bull used for 3 years

Docility, Udder  
Scores and Hoof  
Scores, along with  
visual assessment,  
are not considered

# Scenario 1 - Traits

Calving Ease  
Direct

Calving Ease  
Maternal

Weaning Weight

Milk

Reproduction

- Heifer Pregnancy
- Sustained Cow Fertility

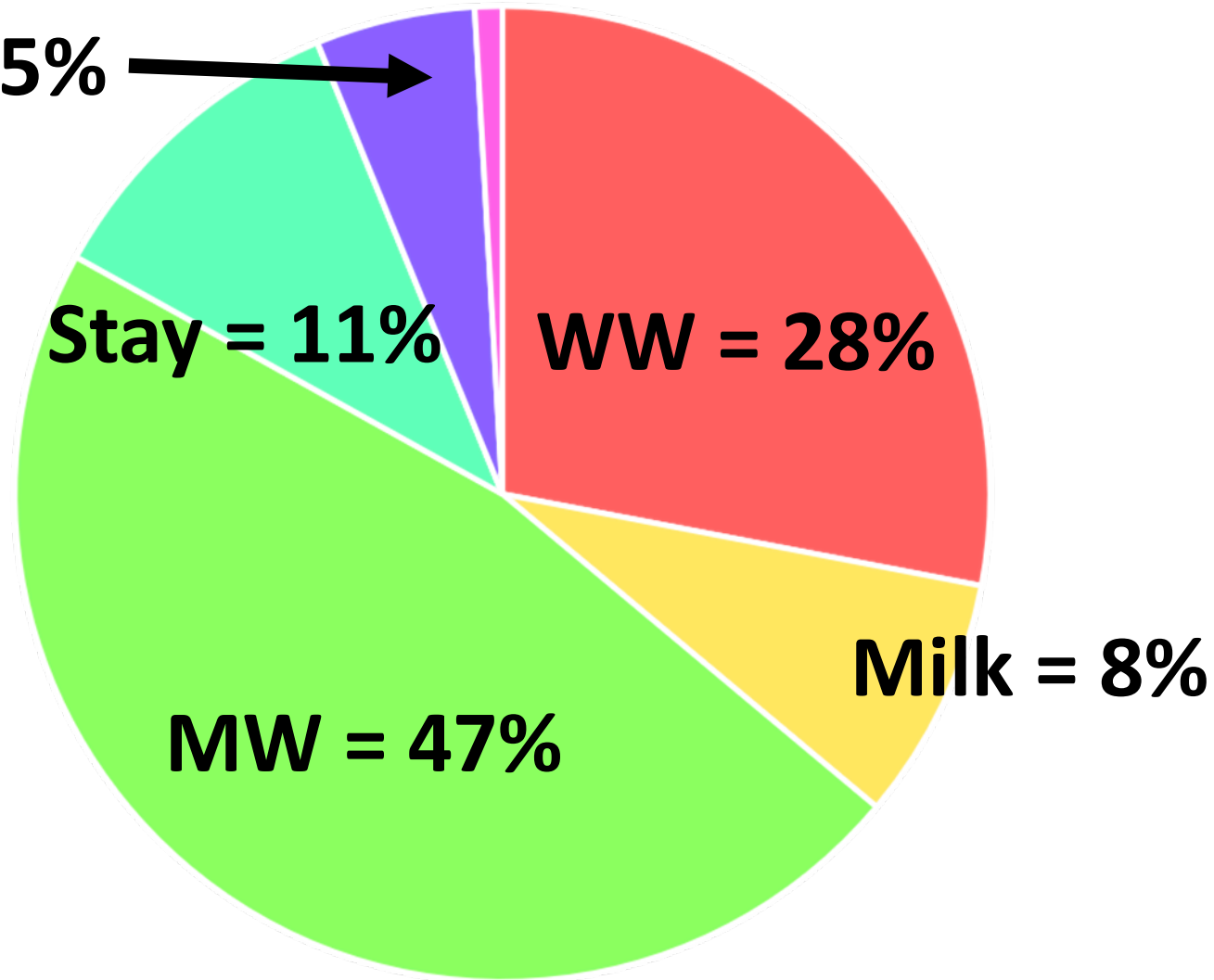
Mature Cow  
Weight

# Angus Scenario 1

emphasis values of the MEV

WW - D WW - M MW - D STAY - D HP - D CE - D CE - M

**CED = 5%**



# Hereford Scenario 1

Emphasis values of the MEV

WW - D WW - M MW - D STAY - D HP - D CE - D CE - M

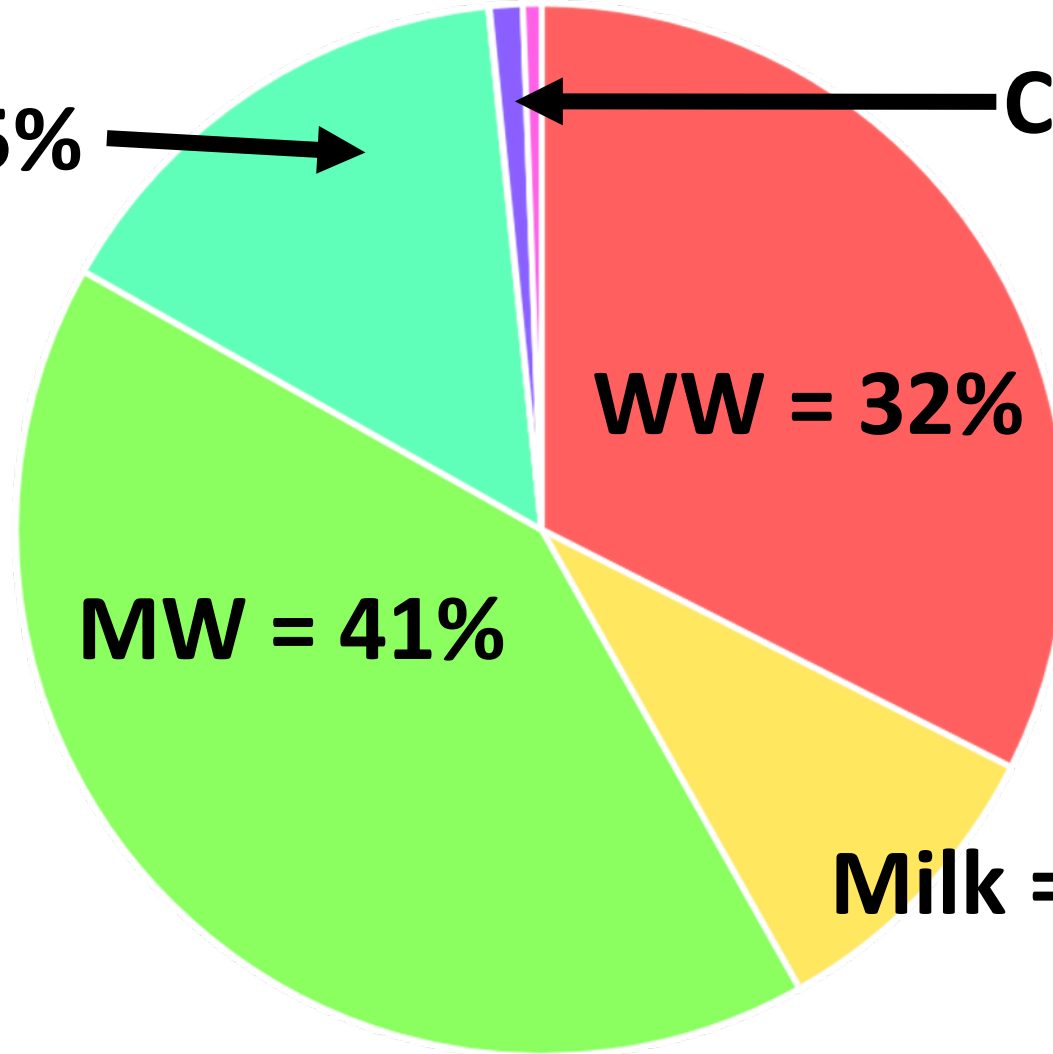
Stay = 15%

CED = 1%

WW = 32%

MW = 41%

Milk = 9%



# SimAngus Scenario 1

Emphasis values of the MEV

WW - D WW - M MW - D STAY - D HP - D CE - D CE - M

**CED = 4%**

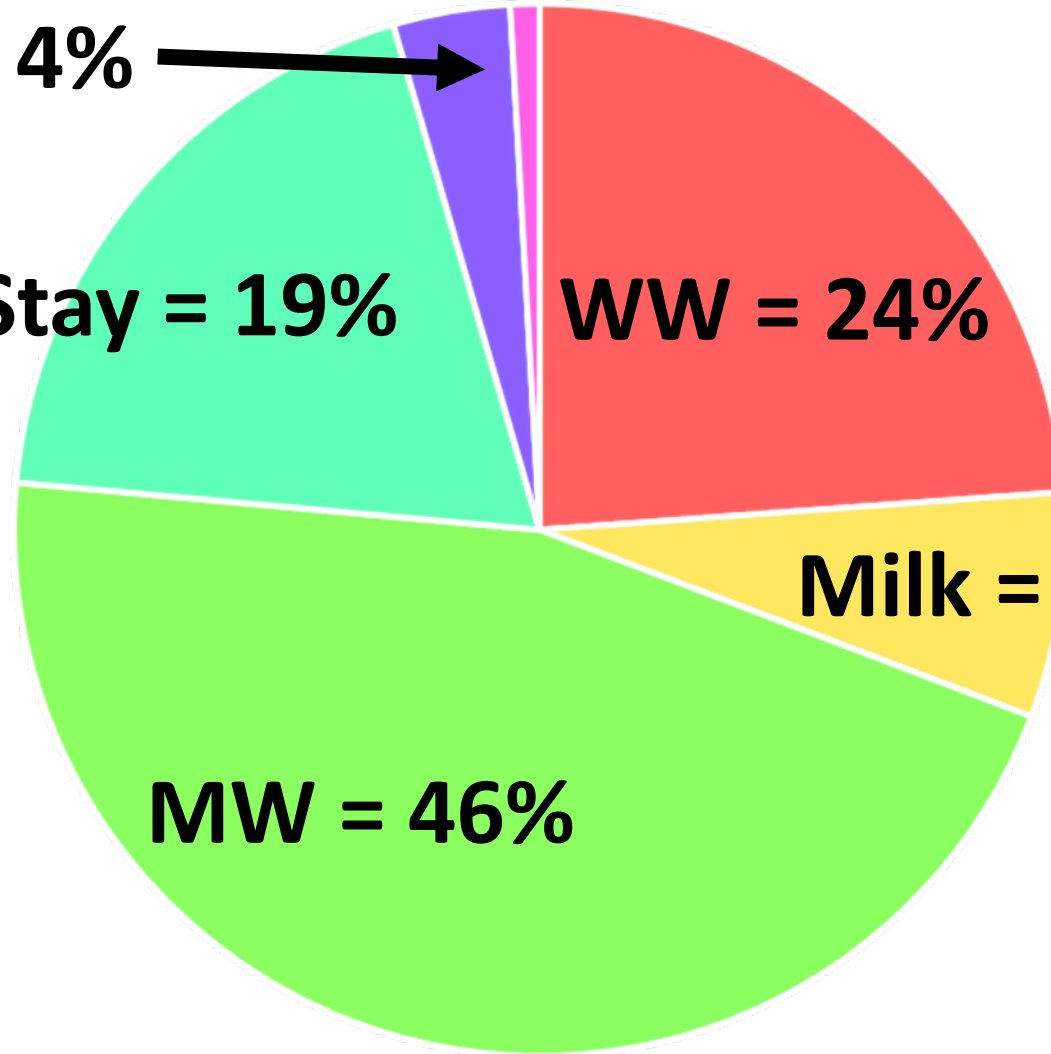


**Stay = 19%**

**WW = 24%**

**Milk = 7%**

**MW = 46%**





# Scenario 1

- 31
- 29
- 23
- 34
- 32
- 33
- 30

**Hereford has a \$936  
heterosis advantage over  
SimAngus and a \$5616  
heterosis advantage over  
Angus**

- 21
- 24
- 22
- 1
- 5
- 8
- 7

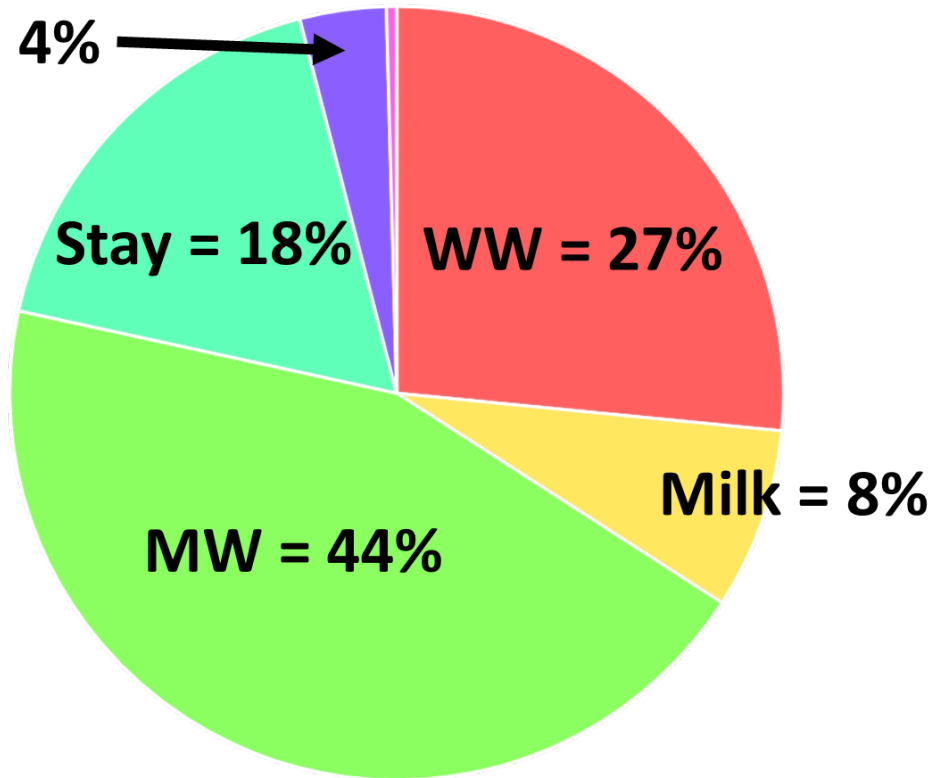
# Angus Scenario 1

## Low vs High Nutrition

Emphasis values of the MEV

WW - D WW - M MW - D STAY - D HP - D CE - D CE - M

CED = 4%

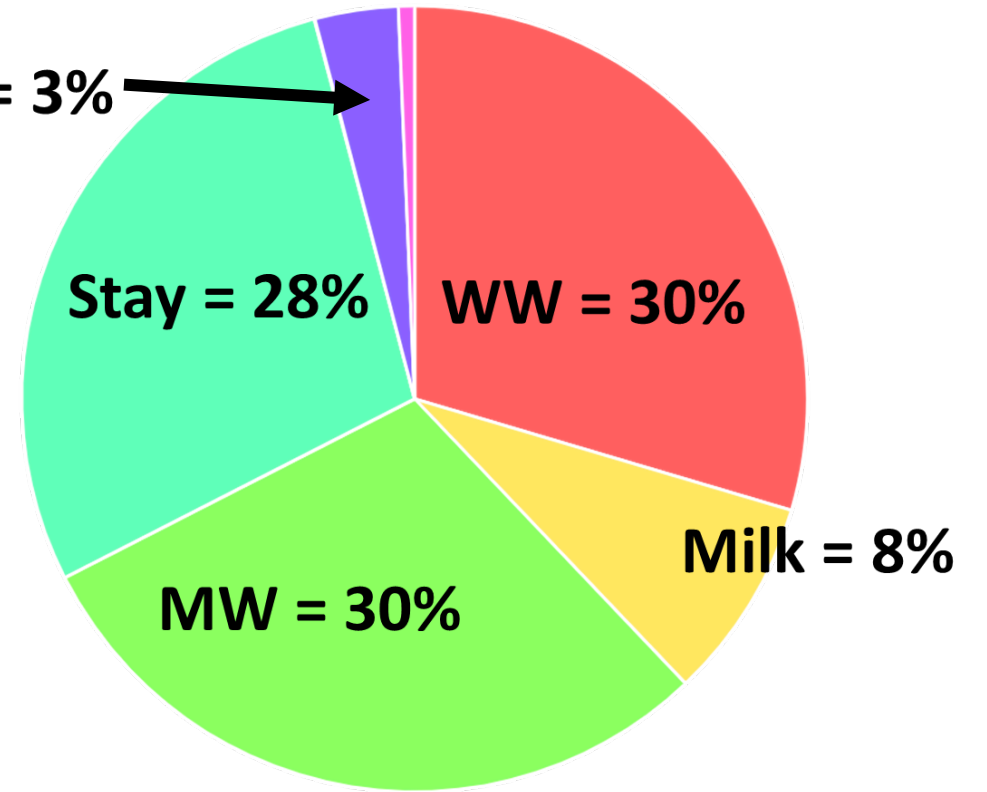


Low Nutrition

Emphasis values of the MEV

WW - D WW - M MW - D STAY - D HP - D CE - D CE - M

CED = 3%



High Nutrition

# Challenges

- Have to make many assumptions
  - Level of heterosis – WW/Cow Exp @ 20% - 2/3 Maternal, 1/3 Individual
  - Each breed run separately through iGENDEC to get breed specific index values
  - Must apply across-breed EPD factors
  - Then use adjusted EPDs in the index formula to get index value
  - How to handle trait with no EPD for a breed – breed average if not available





# Challenges

- Relative value differences by determining the additive value (index) plus the heterosis value multiplied by number calves generated considering replacements and their lifetime productive value
- Creating a way to account for differing levels of nutrition management
  - Assume adequate management has a normal cost for cow maintenance





# Challenges

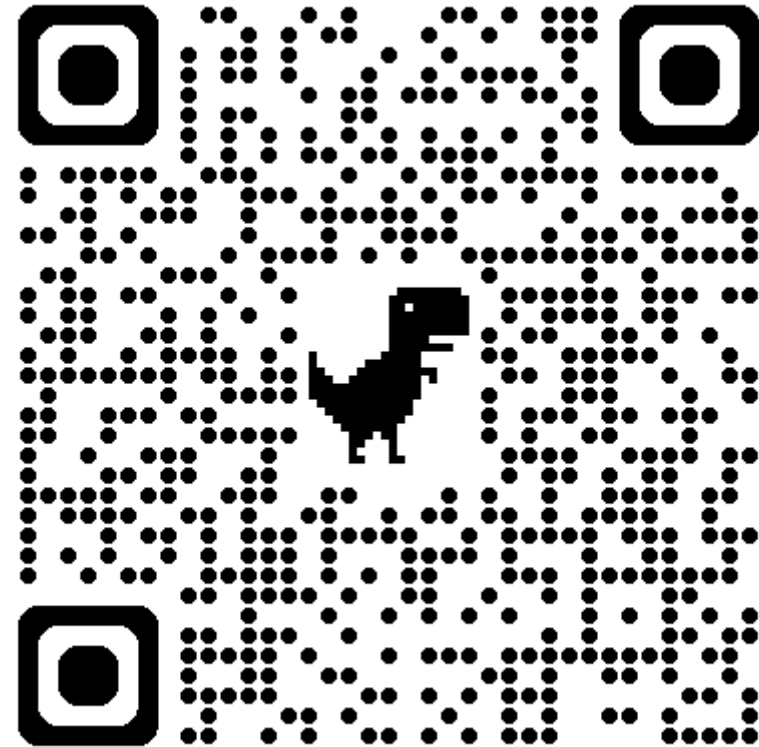
- If all other factors are constant (conception rate, sale weights, pricing, etc.) then under poor forage nutritional management, how much more would it cost to supplement enough to gain those same levels of production
- Alternatively, you would need to make assumptions about how much reduction in conception rate, calf weights that would result
- We used annual cow cost of \$500 to represent high nutrition and \$800 to represent low.



# Opportunities

- Great teachable moments
  - Economic impact of a sound crossbreeding program
    - Explained that everything was taken into account, including discounts for some red calves when the Herefords were used
  - Relative economic importance of various traits under specific management/marketing situations
  - Comparative analysis of the impact of low levels of nutrition verses high on the relative economic emphasis on the traits

# eBEEF.org Bull Selection Assessment Survey



[https://corexmsd9bfwdhxgbhmw.qualtrics.com/jfe/form/SV\\_eFqYgoQpZMJLRLE](https://corexmsd9bfwdhxgbhmw.qualtrics.com/jfe/form/SV_eFqYgoQpZMJLRLE)

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