

# ***BIOFUELS & LAND USE CHANGE: WE HAVE SOME CHOICES TO MAKE***

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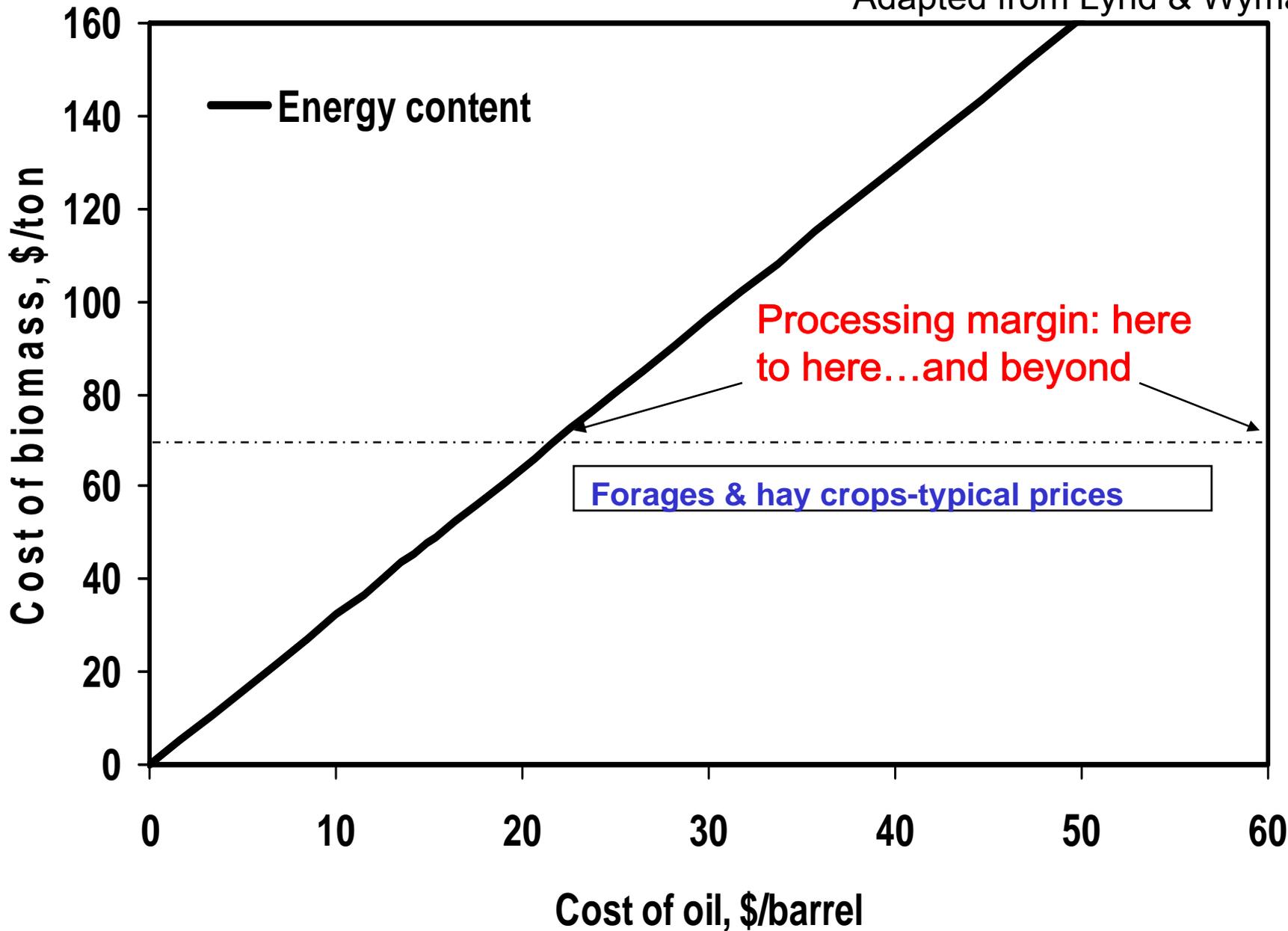
**Presented at:**  
**DOE/ORNL Land Use Change & Bioenergy Workshop**  
**Vonore, Tennessee**  
**May 12-14, 2009**

# Do we want this fuel future?



Or this one?



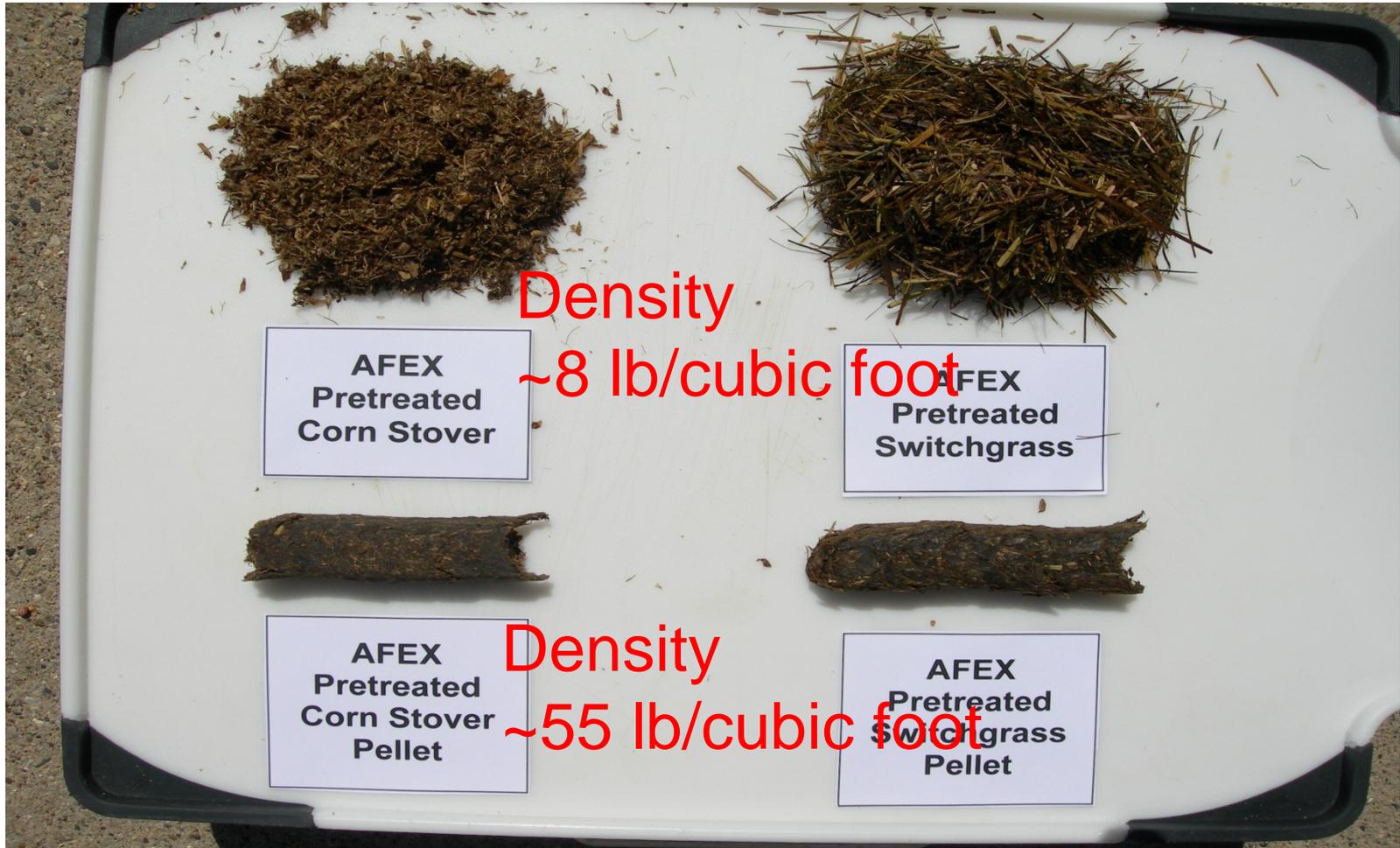


*Cellulosics are the cheapest carbon source in a carbon-constrained world*

# Sloppy Thinking: We Use Land to “Grow Food”

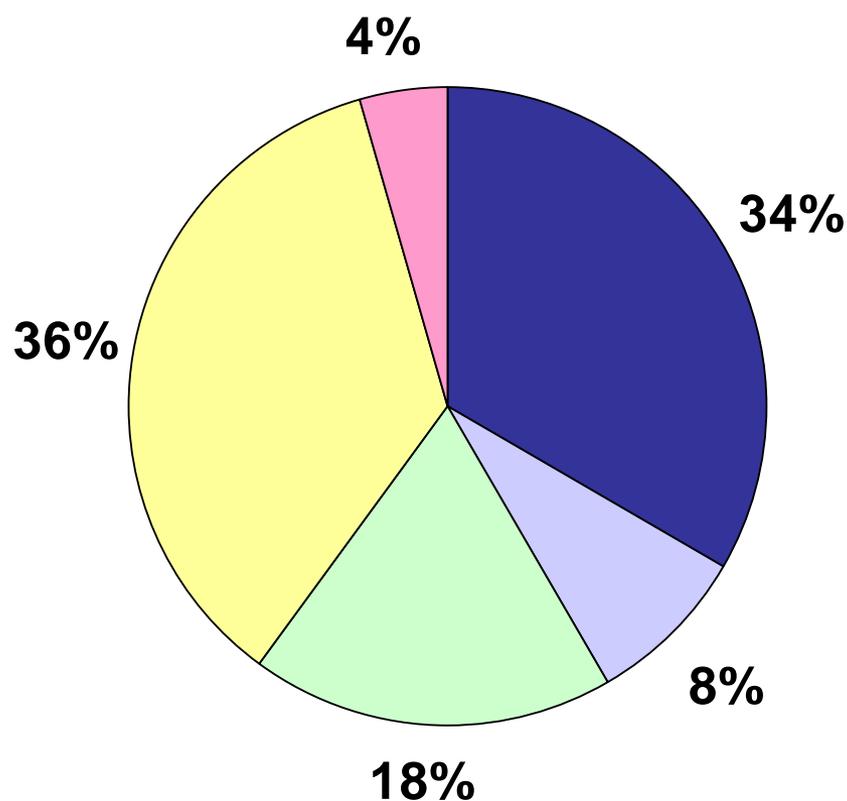
- No, we don't
- About 90% of human use of arable land is to produce animal feed, mostly for beef cattle, not food directly
- Our dietary choices determine to a very great degree how much land we “need” (Lee Lynd)
- 30 million acres of cropland (~6% of total) could provide plenty of food for all Americans
- It is not “food vs. fuel”. Land use, if we continue “business as usual”, is “beef vs. barrels”
- Current ILUC analysis “protects” past land use choices as inherently sustainable, but requires biofuels to prove sustainability...doesn't advance our making choices
- Our future depends largely on our choices & on which technologies we choose to develop
- We can coproduce, quite easily, animal feeds and cellulosic biofuels with very large land use savings

# AFEX Biomass Billets: No Added Binder Surface Lignin Alone is Enough

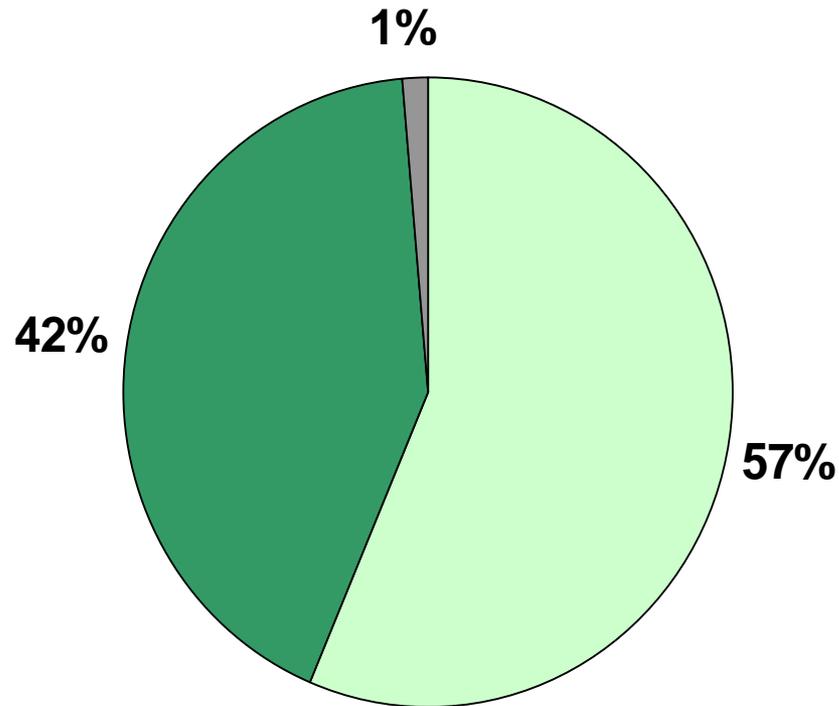


Made using low pressure "cuber" at \$5-10/ton

# Dairy Diet- Black Hawk County Iowa Farm



\$150,242/yr  
265 acres/yr



\$92,388/yr  
167 acres/yr

**From This Immature  
“Cell Phone”ca 1985**



Clunky, didn't work well  
Only one function

**To this Mature One  
ca 2008**



Excellent properties  
Multiple functions