AAE 320 Problem Set #1 **Name:**_____ **Due Sep 18, 2020**

You run a cow-calf operation (https://en.wikipedia.org/wiki/Cow%E2%80%93calf_operation). Each year you save 10 of your heifer calves and raise and breed them for a year to replace cows in your herd. You are considering buying 10 bred heifers each year from your neighbor as replacements instead of raising your own. This would mean selling 10 additional heifer calves in the fall instead of keeping them and avoiding the costs of of feeding and housing them for a year.

You could sell the heifer calves at a weight of 500 pounds for $1.20 per pound (farmers would say $120 per cwt https://en.wikipedia.org/wiki/Hundredweight). You could buy replacement heifers from a neighbor for $1,200, already bred. By selling the heifer calves, you could avoid the costs of feeding and housing them for a year before they were bred heifers ready to add to the herd. You estimate that your cost per heifer per year are $25 for pasture, $200 for grain, hay and mineral supplements, and $100 for veterinary services, labor and breeding costs.
[Based on Tigner 2018: https://www.extension.iastate.edu/agdm/wholefarm/html/c1-50.html]

1) Use the information given to conduct a partial budget analysis for your net gain from selling the heifer calves and instead buying new bred heifers from your neighbor as replacements.

Benefits		Costs	
Additional Revenues What will be the added revenues?		Additional Costs What new costs will be added?	
Costs Reduced What costs will be eliminated?		Revenues Reduced What revenues will be lost?	
Total Benefits		Total Costs	
Total Benefits – Total Costs = Net Gain			

2) Based on these results, is it more profitable to raise your own bred heifers or to buy them from your neighbor?

3) Each year you plant 600 acres: 300 in corn silage and 300 in soybeans. You are considering accepting a USDA cost-share payment to add a cover crop to your corn silage-soybean rotation (https://www.sare.org/resources/cover-crops/). After harvesting corn silage and after harvesting soybeans, you would plant a cover crop to start growing in the early fall. The next spring you would terminate the cover crop with a herbicide as you plant soybeans in the previous corn field and corn silage in the previous soybean field.

   The USDA program pays $30 per acre. The costs to buy cover crop seed and machinery costs to plant it are $35 per acre. Herbicides to terminate the cover crop will increase your costs by $5 per acre. On average, silage yields increase by 0.25 tons per acre, soybean yields by 1.5 bushels per acre. Use a silage price of $24 per ton and a soybean price of $9 per bushel. [Based on Plastina et al. (2018): https://lib.dr.iastate.edu/econ_las_pubs/621/]

   Use the information given to conduct a partial budget analysis for all 600 acres if you were participate in the USDA program and plant cover crops after you harvest silage and soybeans. Show your calculations in the space provided.

<table>
<tr><td colspan="2">Benefits</td><td colspan="2">Costs</td></tr>
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4) Based on these results, is participating in the USDA program and planting cover crops on all 600 acres profitable? Suppose you could choose to participate with only one crop on half of your acre. Which is the profitable crop to adopt a cover crop on: corn silage or soybeans?