| Last Name: | Solares | First Name: | Brenda |
|---|---|---|---|

1. List the 2 convection ovens you have selected to compare (1 pt):

| | |
|---|---|
| Gas Convection Oven Make & Model # | Bakers Pride GDCO-G1 |

| | |
|---|---|
| Electric Convection Oven Make & Model # | Bakers Pride 456GDCO-ER2 S/N: 555341011002 |

2. Discuss the initial purchase costs of each convection oven (all 6) vs. lifetime costs (9 pts):

| Actual $ amount of equipment initial purchase comparison (2): |
|---|
| Gas:<br>Bakers – $4780<br>Base – $3072<br>Energy – $6069<br>Average – $4640<br><br>Electric:<br>Bakers – $3099<br>Base – $2360<br>Energy – $5191<br>Average – $3550<br><br>When comparing the gas convection ovens, the base efficiency is the least expensive of the three. The Bakers Pride oven is second least expensive, and the energy efficient oven is the most expensive.<br><br>When comparing the electric convection ovens, the base efficiency oven is the least expensive. The Baker Pride oven is the second least expensive, and the energy efficient oven is the most expensive.<br><br>The energy efficient ovens were the most expensive in both, electric and gas, categories.<br><br>Comparing all six ovens, the electric base efficiency convection oven was the least expensive, while the gas energy efficient convection oven was the most expensive. |
| Energy cost / gas vs. electric comparison (2): |
| Gas:<br>Bakers – $6168<br>Base – $11160<br>Energy – $7368<br>Average - $8232<br><br>Electric:<br>Bakers – $20424<br>Base – $20400<br>Energy – $15732<br>Average - $18852<br><br>When comparing the gas convection ovens, the Bakers Pride oven had the lowest life time energy cost. The energy efficient oven had the second lowest life time energy cost, and the energy efficient had the highest energy cost. |

When comparing the electric convection ovens, the energy efficient oven had the lowest energy cost. The base efficiency oven had the second lowest energy cost, and the Bakers Pride oven had the highest, though they are very close in price. The base efficiency oven and the Bakers Pride oven only have a $2 difference.

Comparing all six ovens, the Bakers Pride gas convection oven had the lowest energy cost, while the Bakers Pride electric convection oven had the highest energy cost.

Maintenance cost comparison (1):

Gas - Bakers, Base, and Energy: $130/year, $1560/lifetime

Electric - Bakers, Base, and Energy: $135/year, $1620/lifetime

Although the yearly maintenance cost is only a $5 difference, the gas convection ovens would save a total of $60 when chosen over the electric convection oven during its lifetime.

Total lifetime cost comparison (2):

Gas:
Bakers – $12508
Base – $15792
Energy – $14997
Average - $14432

Electric:
Bakers – $25143
Base – $24380
Energy – $22543
Average - $24022

When comparing the gas convection ovens, the Bakers Pride oven has the lowest lifetime cost. The energy efficient oven has the second lowest lifetime cost, and the base efficiency oven had the highest.

When comparing the electric convection ovens, the energy efficient oven has the lowest lifetime cost. The base efficiency oven has the second lowest lifetime cost, and the Bakers Pride has the highest lifetime cost.

Comparing all six ovens, the Bakers Pride gas oven is has the lowest lifetime cost, while the Bakers Pride electric oven has the highest lifetime cost.

Overall cost comparison (2):

While the initial purchase of an electric convection oven is on average $1090 less expensive than a gas convection oven, they tend to be more expensive when it comes to energy cost, maintenance cost, and overall lifetime cost.

Choosing a gas convection oven over an electric convection oven can save an average of $9590 in overall lifetime costs.

For example, the Bakers Pride gas oven ($4780) was the fourth least expensive oven option of the six, but saved the most money when it came to the other costs (lifetime cost of $12508 could save on average $11,514). The Bakers Pride electric oven was lower in price ($3099), but was the most expensive in all other costs when compared to the other six (lifetime cost $25,143).

3. Discuss each convection oven's performance in terms of efficiency and production capacity (2 pts):

Efficiency (%) comparison (1):

Gas:
Baker – 48%
Base – 30%
Energy – 45%
Average – 41%

Electric
Baker – 67%
Base – 65%
Energy – 73%
Average – 68.3%

When comparing the gas convection ovens, the Bakers Pride oven has the highest efficiency. The energy efficient oven has the second highest efficiency, and the base efficiency oven had the lowest.

When comparing the electric convection ovens, the energy efficient oven has the highest efficiency. The Bakers Pride oven has the second highest efficiency, and the base efficiency oven is the lowest.

On average, the electric ovens are 27.3% more efficient than the gas ovens.

Comparing all six convection ovens, the energy efficient electric oven is the most efficient, and the base efficiency gas convection oven is the least efficient. (The energy efficient electric oven is also the most expensive electric oven, while the base efficiency gas convection oven is the least expensive gas oven).

Production Capacity (lb) comparison (1):

Gas:
Bakers – 86 lb
Base – 70 lb
Energy – 83 lb
Average – 80 lb

Electric:
Bakers – 87 lb
Base – 70 lb
Energy – 82 lb
Average – 80 lb

All six convection ovens, both gas and electric, have an average production capacity of 80 lbs.

Each gas convection oven has a very similar production capacity to its electric counterpart.
The Bakers Pride gas oven has an 86 lb production capacity, and the Bakers Pride electric oven has an 87 lb production capacity.
The energy efficient gas oven has an 83 lb production capacity, and the energy efficient electric oven has an 82 lb production capacity.
The base efficiency gas oven has a 70 lb production capacity, and the base efficiency electric oven has a 70 lb production capacity.

4. Compare all 6 convection ovens overall and state your top choice (1 pt).

Overall comparison:

After analyzing the information for all six convection ovens, I decided that my top choice would be the Bakers Pride gas oven. I knew I wanted to narrow it down to a gas convection oven because they have a lower annual energy cost, maintenance cost, and overall lifetime cost. The Bakers Pride gas oven is the second least expensive of the three gas ovens, but has the

lowest energy and overall lifetime cost, along with highest efficiency and highest production capacity of the three gas ovens.

5. Complete the chart below. Discuss the production capacity of your selected convection oven. Is it adequate for your needs? Explain in the box below. (1 pt)

| Your Convection oven's Load Size (lbs potatoes) | Your convection oven's cook time to cook one load of potatoes (min.) | Your Convection oven's Production Capacity (lb/hour) |
|---|---|---|
| 72.8 lb | 51 mins (average) | 86 lb/hr |

The Bakers Pride gas convection oven is adequate for our facilities needs. Its production capacity is 86 lbs/hour, and our facility only needs the oven to make up to 19 lb of french fries per hour during our peak hours – lunch time.
(75 servings of 4 ounces of French fries per hour.)

4oz(1lb/16oz) = 0.25 lb x 75 = 18.75 lb

6. "Make or Buy" decision (4 pts).

| | | | |
|---|---|---|---|
| Fresh Cost per serving: | 0.9692 | Frozen Cost per serving: | 0.6360 |

Will you make or buy your French fries?

I would buy frozen fries because they have a 0.33 cents lower cost per serving than the fresh fries.

7. Provide a justification/proposal for your boss to include at least the following (6 pts):
   a. Reason you need a new convection oven
   b. Which convection oven you propose to purchase
   c. Include the initial cost and lifetime cost ($)
   d. Your reasons for recommending it

Our current convection oven is 12 years old and finally needs to be replaced. Many convection ovens have about a 12 year lifespan, and it would be inconvenient if ours gave out during a work day, where it might take several days to receive a replacement, and can lead to a loss in sales. After analyzing costs and efficiencies of six different convection oven, three electric and three gas, I have concluded that the Bakers Pride GDCO-G1 gas convection oven (60,000 Btu/h) is the best choice for our facility. The initial cost of the oven is $4780 ($220 under the typical $5000 major capital equipment acquisition cost), and the lifetime cost would be $12,508 – the lowest of the six. Although the initial purchase cost of a gas convection oven is slightly higher than the purchase of an electric oven, a gas oven typically has a lower annual energy cost, maintenance cost ($130/year), and overall lifetime cost. Of the three gas ovens I compared, the Bakers Pride oven was the second least expensive. Not only did it have the highest efficiency and highest production capacity of the three gas ovens, but it also had the lowest annual energy cost and lowest overall lifetime cost. Although the electric ovens were on average 20.3% more efficient than the Bakers Pride gas oven, the production of the electricity is actually less efficient at the power plants, and the carbon emissions and pollution from the fuel source may be greater than that of natural gas convection ovens. For these reasons, I hope that you will consider approving the purchase of a new Bakers Pride gas convection oven.

# Gas Convection Oven Life-Cycle Cost Calculation

Courtesy of Pacific Gas and Electric Company
Food Service Technology Center
fishnick.com

| | Bakers Pride GDCO-G* | Base Efficiency Oven | Energy Efficient Oven |
|---|---|---|---|
| **Performance:** | | | |
| Oven Size: | Full Size | Full Size | Full Size |
| Preheat Energy: (Btu) | 9050 | 19000 | 11000 |
| Idle Energy Rate: (Btu/h) | 9253 | 18000 | 11758 |
| Heavy-Load Energy Efficiency: (%) | 48 | 30.0 | 45.0 |
| Production Capacity: (lbs/h) | 86 | 70.0 | 83.0 |
| **Usage:** | | | |
| Operating Hours per Day: (h/day) | 12.0 | 12.0 | 12.0 |
| Operating Days per Year: (d/year) | 365 | 365 | 365 |
| Number of Preheats per Day: (#/day) | 1 | 1 | 1 |
| Pounds of Food Cooked: (lbs/day) | 100.0 | 100.0 | 100.0 |
| **Utility Cost and Lifespan:** | | | |
| Gas Cost per Therm: ($/therm) | $0.884 | $0.884 | $0.884 |
| Lifespan of Oven: (years) | 12.0 | 12.0 | 12.0 |
| Discount Rate: (%/year) | 0.00 | 0.00 | 0.00 |
| **Other:** | | | |
| Maintenance Costs per Year: | $130 | $130 | $130 |
| Initial Cost of Oven: | $4780 | $3072 | $6069 |
| **Results:** | | | |
| Annual Energy Consumption: (Therms) | 581 | 1052 | 695 |
| Average Energy Consumption Rate: (Btu/h) | 13258 | 24010 | 15879 |
| Annual Energy Cost: | $514 | $930 | $614 |
| Lifetime Energy Cost: | $6168 | $11160 | $7368 |
| Lifetime Maintenance Cost: | $1560 | $1560 | $1560 |
| Initial Cost of Oven: | $4780 | $3072 | $6069 |
| **Total Lifetime Cost:** | **$12508** | **$15792** | **$14997** |

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# Electric Convection Oven Life-Cycle Cost Calculation

Courtesy of Pacific Gas and Electric Company
Food Service Technology Center
fishnick.com

| | Bakers Pride456GDCO-ER2 S/N: 555341011002 | Base Efficiency Oven | Energy Efficient Oven |
|---|---|---|---|
| **Performance:** | | | |
| Oven Size: | Full Size | Full Size | Full Size |
| Preheat Energy: (kWh) | 1.43 | 1.50 | 1.00 |
| Idle Energy Rate: (kW) | 1.99 | 2.00 | 1.40 |
| Heavy-Load Energy Efficiency: (%) | 67.0 | 65.0 | 73.0 |
| Production Capacity: (lbs/h) | 87.0 | 70.0 | 82.0 |
| **Usage:** | | | |
| Operating Hours per Day: (h/day) | 12.0 | 12.0 | 12.0 |
| Operating Days per Year: (d/year) | 365 | 365 | 365 |
| Number of Preheats per Day: (#/day) | 1 | 1 | 1 |
| Pounds of Food Cooked: (lbs/day) | 100.0 | 100.0 | 100.0 |
| **Utility Cost and Lifespan:** | | | |
| Electric Cost per kWh: ($/kWh) | $0.1394 | $0.1394 | $0.1394 |
| Electric Demand Cost per kW: ($/kW) | $0.00 | $0.00 | $0.00 |
| Lifespan of Oven: (years) | 12.0 | 12.0 | 12.0 |
| Discount Rate: (%/year) | 0.00 | 0.00 | 0.00 |
| **Other:** | | | |
| Maintenance Costs per Year: | $135 | $135 | $135 |
| Initial Cost of Oven: | $3099 | $2360 | $5191 |
| **Results:** | | | |
| Annual Energy Consumption: (kWh) | 12209 | 12193 | 9406 |
| Average Energy Consumption Rate: (kW) | 2.8 | 2.8 | 2.1 |
| Annual Energy Cost: | $1702 | $1700 | $1311 |
| Lifetime Energy Cost: | $20424 | $20400 | $15732 |
| Lifetime Maintenance Cost: | $1620 | $1620 | $1620 |
| Initial Cost of Oven: | $3099 | $2360 | $5191 |
| **Total Lifetime Cost:** | **$25143** | **$24380** | **$22543** |

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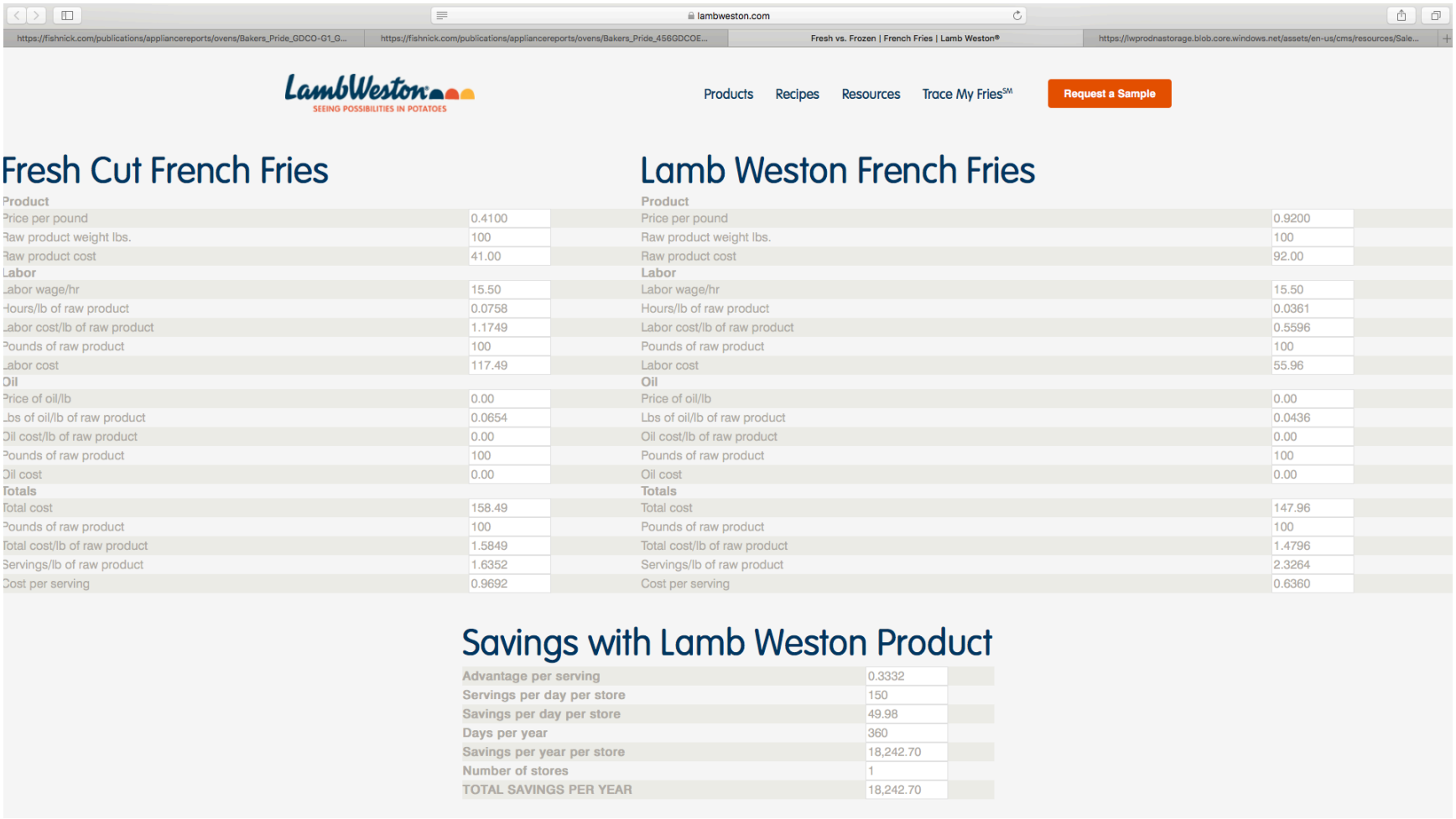


## Fresh Cut French Fries

| Product | |
|---|---|
| Price per pound | 0.4100 |
| Raw product weight lbs. | 100 |
| Raw product cost | 41.00 |
| **Labor** | |
| Labor wage/hr | 15.50 |
| Hours/lb of raw product | 0.0758 |
| Labor cost/lb of raw product | 1.1749 |
| Pounds of raw product | 100 |
| Labor cost | 117.49 |
| **Oil** | |
| Price of oil/lb | 0.00 |
| Lbs of oil/lb of raw product | 0.0654 |
| Oil cost/lb of raw product | 0.00 |
| Pounds of raw product | 100 |
| Oil cost | 0.00 |
| **Totals** | |
| Total cost | 158.49 |
| Pounds of raw product | 100 |
| Total cost/lb of raw product | 1.5849 |
| Servings/lb of raw product | 1.6352 |
| Cost per serving | 0.9692 |

## Lamb Weston French Fries

| Product | |
|---|---|
| Price per pound | 0.9200 |
| Raw product weight lbs. | 100 |
| Raw product cost | 92.00 |
| **Labor** | |
| Labor wage/hr | 15.50 |
| Hours/lb of raw product | 0.0361 |
| Labor cost/lb of raw product | 0.5596 |
| Pounds of raw product | 100 |
| Labor cost | 55.96 |
| **Oil** | |
| Price of oil/lb | 0.00 |
| Lbs of oil/lb of raw product | 0.0436 |
| Oil cost/lb of raw product | 0.00 |
| Pounds of raw product | 100 |
| Oil cost | 0.00 |
| **Totals** | |
| Total cost | 147.96 |
| Pounds of raw product | 100 |
| Total cost/lb of raw product | 1.4796 |
| Servings/lb of raw product | 2.3264 |
| Cost per serving | 0.6360 |

## Savings with Lamb Weston Product

| | |
|---|---|
| **Advantage per serving** | 0.3332 |
| **Servings per day per store** | 150 |
| **Savings per day per store** | 49.98 |
| **Days per year** | 360 |
| **Savings per year per store** | 18,242.70 |
| **Number of stores** | 1 |
| **TOTAL SAVINGS PER YEAR** | 18,242.70 |