



# Developing a New Flavor of Hard Cider

Client: Virtue Cider

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## Problem

- Approached by Anheuser Busch and Virtue Cider
- Our goal: to develop a new fruit flavor of hard cider
- Under the constraints:
  - > 100 calories
  - > 3.5% ABV
  - 8/10 people must taste fruit flavor
  - Flavor cannot be apple or pear
- Other considerations:
  - US FDA alcohol regulations and tax classifications
  - Virtue Cider's all-natural brand
  - Experimentation on non-alcoholic cider
  - Profits and consumer responses

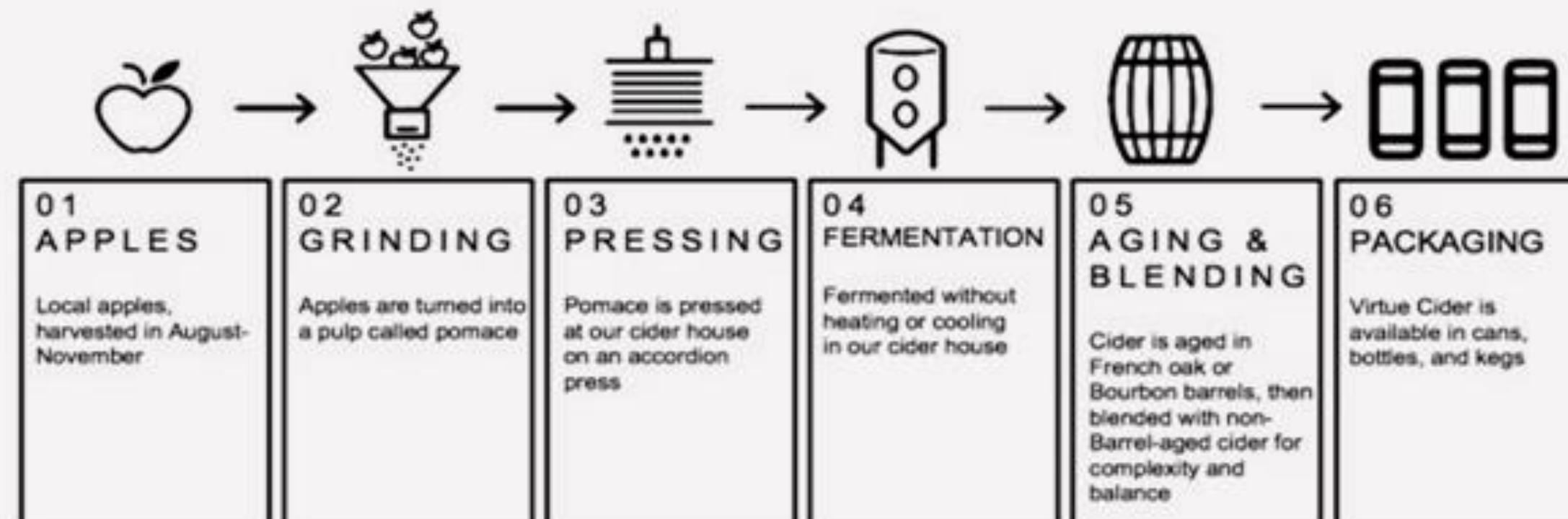
## Research

Client: Virtue Cider

- Founded in 2011 by Gregory Hall and based in Fennville, MI
- Partnered with Anheuser-Busch in 2015
- Creates exciting and delicious ciders using all-natural ingredients
- Releasing new brand of low-calorie sparkling ciders in 2019



### Hard Cider Manufacturing Process

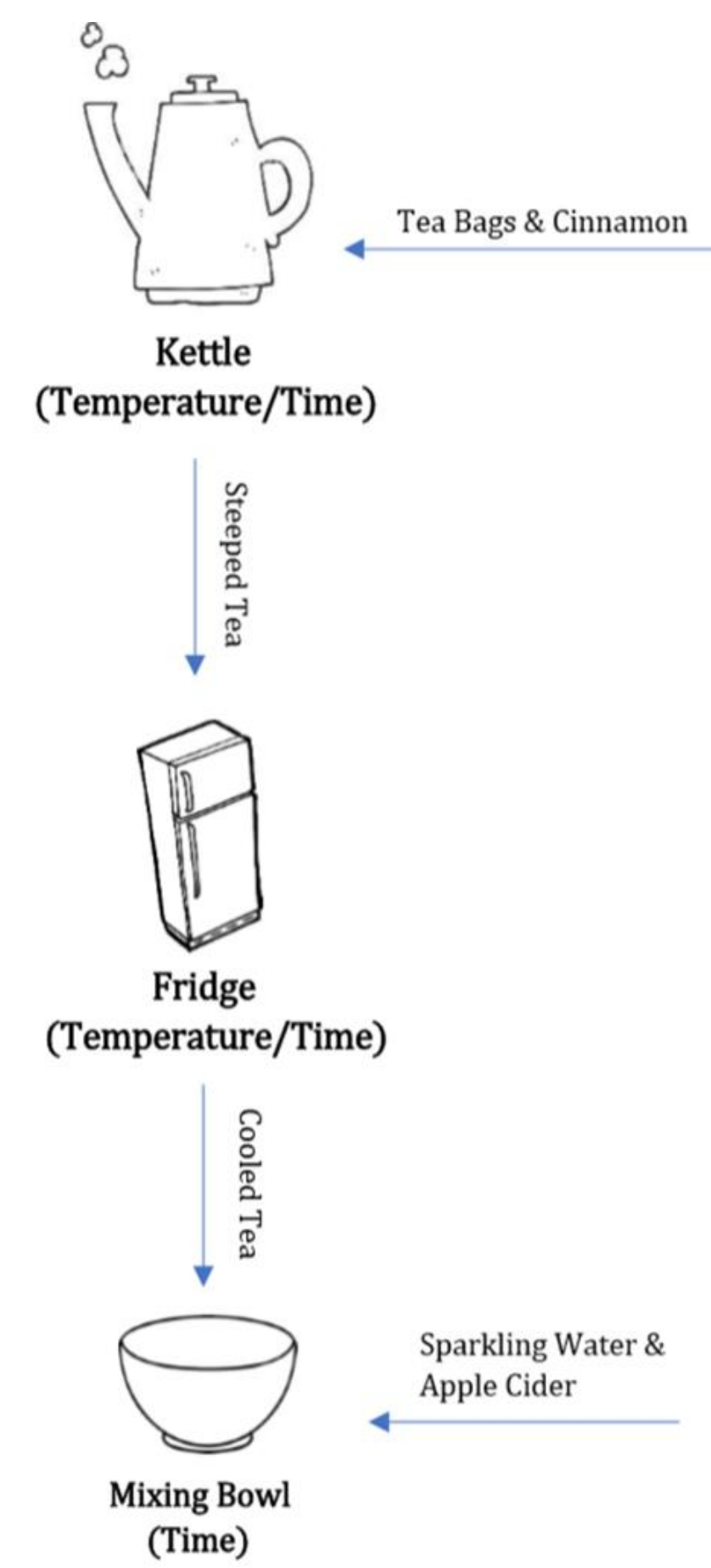


### Hard Cider Classification by Alcohol and Tobacco Tax and Trade Bureau

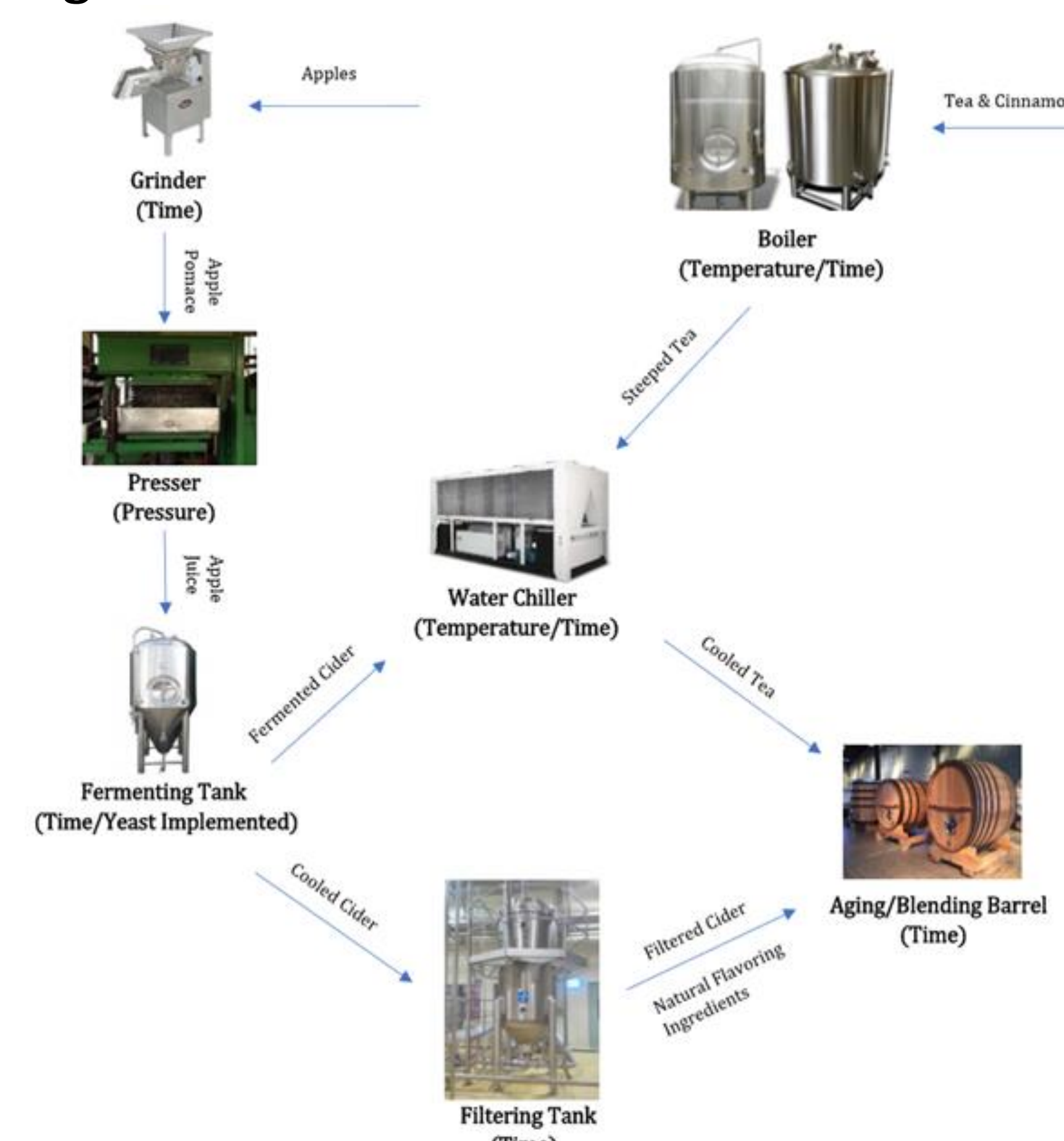
- Defined as still wine derived primarily from apples
  - Alcohol content between 0.5% and 7%
  - Containing no other fruit flavor or artificial flavor that imparts another fruit flavor
  - Taxed at \$0.226/gallon
- Higher alcohol content, additional flavoring, or carbonation all place ciders into a different tax classification
  - Worked with botanicals and spices to stay in the lowest possible tax classification

## Process Flow Diagrams

### Lab Scale



### Large-scale Production



## Taste Ballot Data

Rank the samples from 1-9, with 5 being the same as the control, 1-4 being less than the control, and 6-9 being more than the control in each category

	Category				
Sample	Sweetness	Tartness	Apple flavor	Aftertaste	Detectable Cranberry Flavor (0 = no, 1 = yes)
Control	5	5	5	5	0
1	4.5	5.6	4.4	4.5	0.8
2	3.9	5.8	3.6	6.5	0.7
3	5.1	5	4.4	5.4	0.8
4	4.4	6	4	5.4	0.7

## References

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## Economic Analysis

- Ingredient Prices
  - Hibiscus petal loose tea: \$29.00/lb
  - Ground Cinnamon: \$7.65/lb
- For a 100 L batch of hard cider
  - Hibiscus tea: \$54.00, Cinnamon: \$1.05, Overall cost: \$55.05
  - Makes about 58 cases of hard cider (Six pack of 12 oz cans)
  - To break even, charge an extra \$1.04

## Final Product

- **Final flavor profile: cranberry cider**
  - Opportunities for holiday branding
  - Complements apple flavor
  - No added sugar or calories
- Our final recipe:
  - 4 hibiscus tea bags for 1 cup of water
  - ¼ tsp cinnamon
  - Mixed with 2 parts sparkling water, 2 parts cider, and 1 part spiced tea
- Chosen based on taste ballot data
  - 8 out of 10 people detected a cranberry flavor
  - Averages were closer to control

## Conclusion

Based on our research, data, and experimentation, we concluded that **cranberry flavored cider** made with **hibiscus tea and cinnamon** will produce the best tasting cider that still qualifies in the **hard cider tax classification**.



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