# Food Loss in Vermont

## Estimating Annual

outline opportunities for next steps. We conclude by emphasizing the enormous potential to reduce the amount of food loss in Vermont.

## When and Why is Food Lost?

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## How Much Food is Lost Annually in Vermont?

Each year, farmers in Vermont harvest 3,897 acres of vegetables[7] and 601 acres of

Then, taking the annual expected yields for Vermont - 84.9 million pounds of vegetables[9] and 3.9 million pounds of berries[10] – we followed the decision tree illustrated in Figure 1 below to calculate (1) the pounds of edible vegetables and berries that were unpicked and, (2) the pounds of picked vegetables and berries that were neither sold nor donated.

Figure 1. Path to calculating food loss

The sum of these two categories is salvageable food loss – wholesome food that can be sold to consumers or donated to community organizations. Below, we look at the magnitude of these estimates.

## Statewide Food Loss Estimate

### Vegetable s vs. Berries

Of the of food loss in Vermont, there is and . In Graph 2, we see this breakdown in terms of percentages: 4% of the total food loss is berries, while 96% of the total food loss is vegetables. This is due to the fact that Vermont grows 22 times more vegetables than berries. Indeed, a comparable percentage of total vegetables and berries are lost:

Graph 7. Total berry loss, by county

## Limitations

There are three main concerns, or limitations, with regards to our food loss estimate. First regards million pounds of vegetables being grown annually[11]. With berries, we used 0.15 pounds/ft$^2$, which is the average of the expected yields for strawberries, blueberries, and raspberries published by University of Vermont Extension's Vegetable and Berry Crop Yield Estimates for New England [12].

Were we to use lower estimators to calculate expected yields - below 0.5 and 0.15, respectively - the estimates for food loss would also decrease. Conversely, if we were to use higher figures – above 0.5 and 0.15 - the estimates for food loss would also increase. It is important to keep in mind that our food loss estimates are rooted in having generated expected crop yields based on the 0.5 pounds/ft$^2$ for vegetables and 0.15 pounds/ft$^2$ for berries, and that altering these estimates does change the food loss estimates.

As a robustness check to the expected vegetable yield per sq3(t)a robustnese81P <<MCID 2>>BDC



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Graph 8. Range of total vegetable loss based on use of low, mean, and upper bound estimates of farmer percentages

Likewise, using the lower or upper bound estimates instead of the mean would also change the estimated berry loss estimates. As you can see in Graph 9, using the lower estimate would decrease the total berry loss estimate from 590 thousand pounds to 126 thousand pounds, while using the upper estimate would increase the estimate to 1.2 million pounds.

Graph 9. Range of total berry loss based on use of low, mean, and upper bound estimates of farmer percentages

In order to obtain narrower ranges of estimates for vegetab9(he86.9( )-a)3(nd) h/51r1f4[(t)ee86.9

the major gleaning operations in Vermont – the Vermont Gleaning Collective[14] and the Vermont Foodbank Gleaning Program[15] – gleaned a total of 617,696 pounds in 2015, or 14% of the total number of pounds of edible produce that is unpicked[16]. To

If we were to subtract our rough estimates of produce gleaned, produce consumed by farmers, and produce made into value-added product by farmers – a total of 1.7 million pounds - this would still only reduce our total food loss estimate from 14.3 million pounds to 12.5 million pounds. Therefore, while we recommend further research, we do not think that it will significantly change the magnitude of the estimate of food loss in Vermont.

## Future Research

In this section, we discuss two main areas for future research regarding food loss in Vermont: calculating food loss and reducing food loss.

### Calculating Food Loss

#### Vegetable and Berry Loss

Moving forward, it would be valuable to obtain more information on food loss with regards to the 'top' vegetables and berries grown in Vermont. The 2012 Census of Agriculture reports that the top vegetables grown in Vermont, in terms of number of acres harvested, are tomatoes, potatoes, sweet corn, pumpkins and squash (winter and summer). The top berries, also in terms of acres harvested, are strawberries, blueberries, and raspberries. In the Vermont Food Loss Survey, the average vegetable farm grew 33.4 types of vegetables and the average berry farm grew 4.6 types of berries. Taking into account that unique strategies will need to be developed in order to capture crop-specific food loss –

Table 5. Where farmers keep records, by what farmers record

| | Amount Plant | Amount Harvest | Amount Sell |
|---|---|---|---|

speaks to the larger question of how to create a system that better supports and benefits farmers, and ultimately place more food on people's plates.

## Access to Markets

Farmers sell their produce in a number of different markets - via direct sales to restaurants and food cooperatives, to in-state and out-of-state wholesalers, and at farmers markets, farm stands, and CSAs. Indeed, most

There is enormous potential to scale up efforts and capture larger amounts of the available food loss. The more integrated these efforts are with farms' existing operations and routines, the more successCgd loss. h

## Acknowledgements

We extend our thanks to the dozens of farmers who lent us their time and insights by filling out the Vermont Food Loss Survey. We are very grateful to the many farmers we interviewed from across the state during the survey development stage, as well.

We could not have obtained such a great response from farmers without the support of the many partners who distributed the Vermont Food Loss Survey to their farmer

## References

Grubinger, Vern. University of Vermont Extension. Vegetable and Berry Crop Yield Estimates for New England. May 2013.
Available at:

## Appendix B

Table B-1. Vegetable loss, by county

| | Acres of Vegetables Harvested | Percent of Vermont Vegetable Acres Harvested | Edible vegetables left unpicked (lbs) | Picked vegeables neither sold nor donated (lbs) | Total Vegetable Loss (lbs) |
|---|---|---|---|---|---|
| Addison County | 258 | 7% | 291,664 | 614,852 | 906,516 |
| Bennington County | 128 | 3% | 144,702 | 305,043 | 449,744 |
| Caledonia County | 147 | 4% | 166,181 | 350,323 | 516,503 |
| Chittenden County | 830 | 21% | 938,300 | 1,978,012 | 2,916,37 70.8 |