



# PFAS Study in North Pole Area Produce

July 2019

PFAS are man-made chemicals used in industry and consumer products worldwide since the 1950s. PFAS do not easily break down in the environment, and they may travel rapidly to groundwater where they can spread. In Alaska, PFAS in the environment are often linked to the use of certain foams used in firefighting or fire training activities.

Some PFAS have been found to accumulate in fruits and vegetables irrigated with water that contains PFAS. The amount taken up into the plants varies based on the PFAS concentration, the types of PFAS in the water, and the type of produce grown.

## PFAS terms used in this Fact Sheet:

PFOS - perfluorooctane sulfonic acid  
PFOA - perfluorooctanoic acid  
PFPeA - perfluoropentanoic acid

PFNA - perfluorononanoic acid  
PFHxS - perfluorohexanesulfonic acid

PFHpA - perfluoroheptanoic acid  
PFBA - perfluorobutanoic acid

## PFAS Sampling

In October 2018, water from a well at a local North Pole farm was found to contain PFAS — 82 parts per trillion (ppt) using a sum of 5 PFAS; 16 ppt using a sum of 2 PFAS. The water from the well was used for watering fruits and vegetables grown at the farm.

Fruits and vegetables grown at the farm were sampled and analyzed for PFAS in December 2018. The sampling was conducted to determine if PFAS was taken up into the locally grown produce at levels of concern. Produce from the farm is eaten by the residents and may be provided to local schools as part of the school lunch program.

Studies in other parts of the country have shown that another PFAS compound, PFBA, readily accumulates in edible plants.

DEC collected 45 produce samples from three separate plots and analyzed the samples for 32 different PFAS. The samples included the following 14 types of fruits and vegetables:

- Beet
- Broccoli
- Brussels sprouts
- Cabbage
- Green beans
- Kale
- Leeks
- Onion

- Carrot
- Cauliflower
- Chard
- Potato
- Squash
- Strawberry

## Results from Locally Grown Produce

PFAS were not detected in any sample of beets, broccoli, carrots, cauliflower, chard, green beans, leeks, onions, potato or squash.

One of the **strawberry** samples had an estimated PFOA concentration of 0.22 parts per billion (ppb).

One of the **cabbage** samples had an estimated PFBA concentration of 0.66 ppb.

All three **brussels sprout** samples had PFBA detections ranging from 2.0 to 2.4 ppb.

All three **kale** samples had PFBA detections ranging from 3.3 to 5.2 ppb. One of the kale samples had an estimated PFPeA concentration of 0.19 ppb.

## Produce Risk Evaluation

The Alaska Department of Health and Social Services (DHSS) evaluated whether exposure to PFAS may pose a risk to people eating produce grown on the

property that was irrigated with PFAS-contaminated well water.

DHSS evaluated exposure to:

- Children and adults who attend or work at schools who consume meals that could include produce from the local farm, and
- Children and adults who consume produce from the local farm as their primary source of fruits and vegetables.

## Conclusions and Recommendations

- Some PFAS can be taken up and accumulate in fruits and vegetables irrigated with water containing PFAS.
- The amount of PFAS in fruits and vegetables can depend on a number of issues including the concentrations in water used for irrigation, the type of PFAS, the type of

produce, and growing practices. The results and conclusions presented in this fact sheet only apply to the produce sampled at this location.

- Plastic mulch used at the farm had low level detections of some PFAS. Impact on the produce concentrations is unknown.
- DHSS determined the hazard associated with exposure to PFAS through eating vegetables and strawberries grown at the local farm is negligible for both students and employees in the Fairbanks North Star Borough School District and for individuals who rely on produce grown at the property as a source of subsistence foods (e.g., property owners/farmers and their families).
- The farm owners decided to install a carbon-based water treatment system for PFAS removal from well water used for irrigation.

## Contacts

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For more information on PFAS, please visit the following websites:

<https://dec.alaska.gov/spar/csp/pfas/>  
[dhss.alaska.gov/dph/Epi/eph/Pages/PFAS.aspx](https://dhss.alaska.gov/dph/Epi/eph/Pages/PFAS.aspx)  
[dec.alaska.gov/spar/csp/sites/north-pole-refinery.aspx](https://dec.alaska.gov/spar/csp/sites/north-pole-refinery.aspx)