

# Tracing in FoodChain-Lab

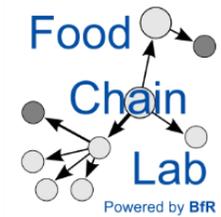


## Learn

- to visualise forward and backward traces of a station in the Tracing View
- to deactivate “Cross Contamination” and how this changes the trace

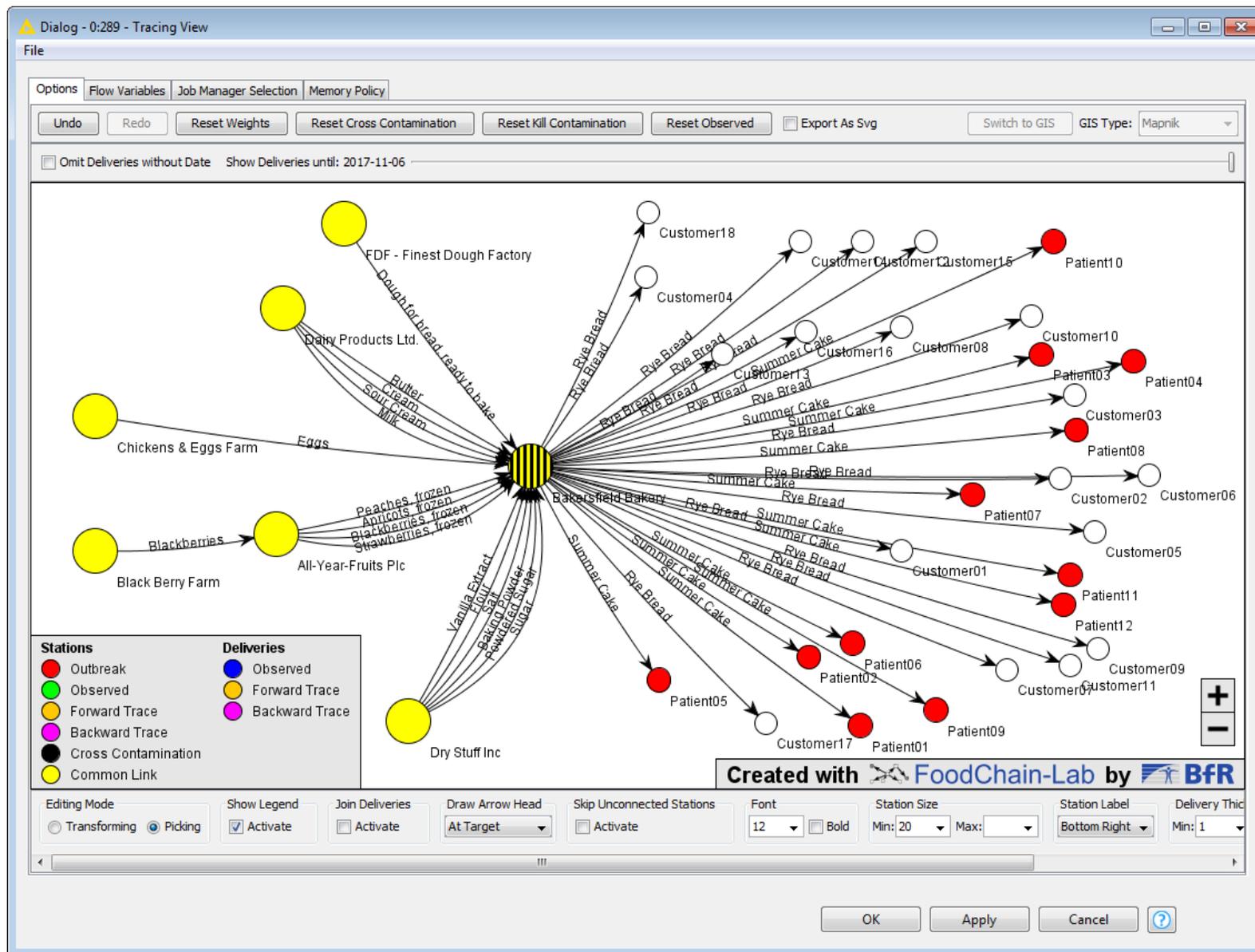
# Step 1

The screenshot displays the KNIME Analytics Platform interface. The main workspace shows a workflow with two nodes: 'Supply Chain Reader' and 'Tracing View'. The 'Tracing View' node is circled in red. The 'Node Description' panel on the right provides details about the 'Tracing View' node, including its purpose and configuration options. The 'Node Description' panel text reads: 'This node can visualize a supply chain. The three mandatory input ports expect a station table, an delivery table and a delivery relations table. These tables are provided by the Supply Chain Analyzer. Tracing can be performed by setting the following four properties for stations and deliveries: "Case Weight", "Cross Contamination", "Kill Contamination" and "Observed". You can change the property values by double clicking on a station/delivery or by using "Station/Delivery Selection -> Show Properties" from the context menu. Based on these properties the following values are



- Import the example workflow “FCL\_Tracing\_Tutorial.knwf”.
- Open the Tracing View by double clicking on it.

# Step 1



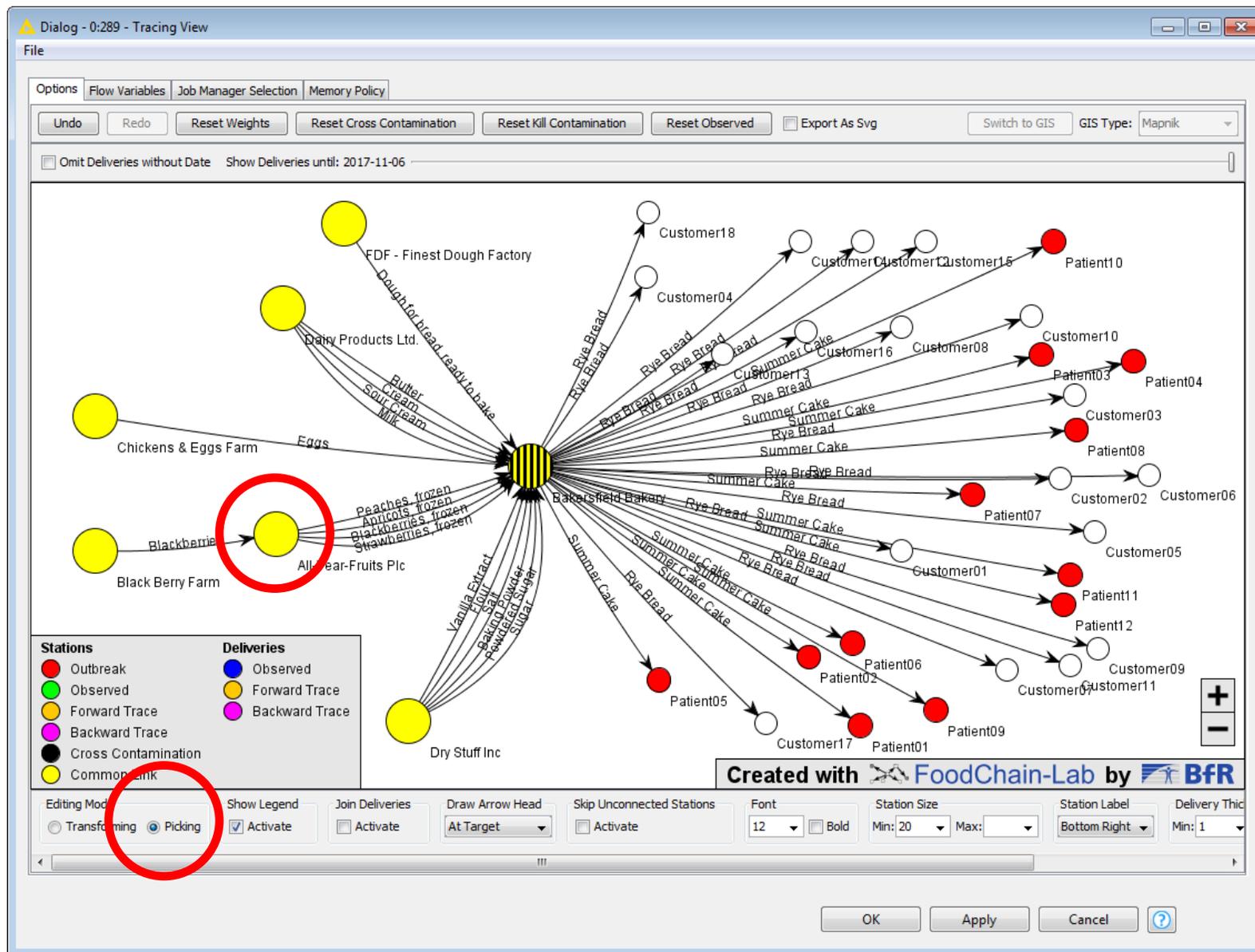
- In the delivery graph you can see 12 outbreak stations (red), six stations which are connected to outbreak stations and are thus a common link (yellow) and one station (the Bakersfield Bakery) which is both a common link (yellow) and in which also cross contamination is assumed (black).

# Step 1



- To show two properties, stations are striped. Here, the Bakersfield bakery is striped black and yellow.
- The size of each station is based on its "Score", which depends on the outbreak stations that are connected to each station.
- In this scenario, the outbreak stations are people. They have bought a product which was contaminated and they became ill. We want to find out, where the source of the contamination is. But do we already know enough to solve the riddle *in silico*?

## Step 2



- There is a suspicion that *All-Year-Fruits Plc* has supplied contaminated products. We will now observe the trace of this station in detail. We would like to see whether the company's forward trace reaches the outbreak stations.
- Use the editing mode "picking" and double click on the station in the red circle.

## Step 3

Properties

Input

Weight: 0.0

CrossContamination:

Kill Contamination:

Observed:

Tracing

Score: 1.0

Max Lot Score: 1.0

Normalized Score: 1.0

Positive Score: 1.0

Negative Score: 0.0

Backward: false

Forward: false

ID: -1732895535

Name: All-Year-Fruits Plc

Country: DE

type of business: Supplier

SimpleSupplier: false

DeadStart: false

DeadEnd: false

node: All-Year-Fruits Plc

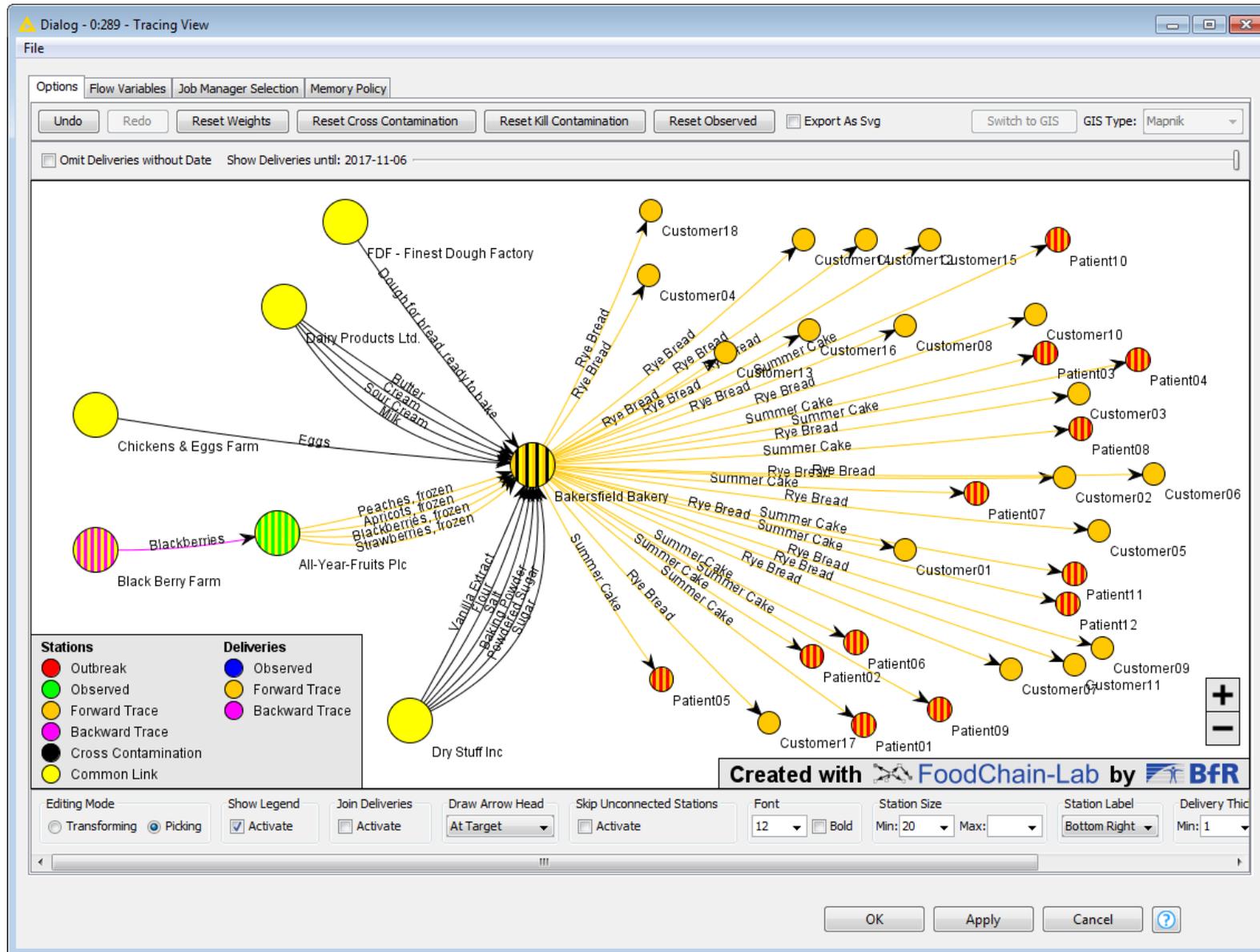
County:

IsMeta:

OK Cancel

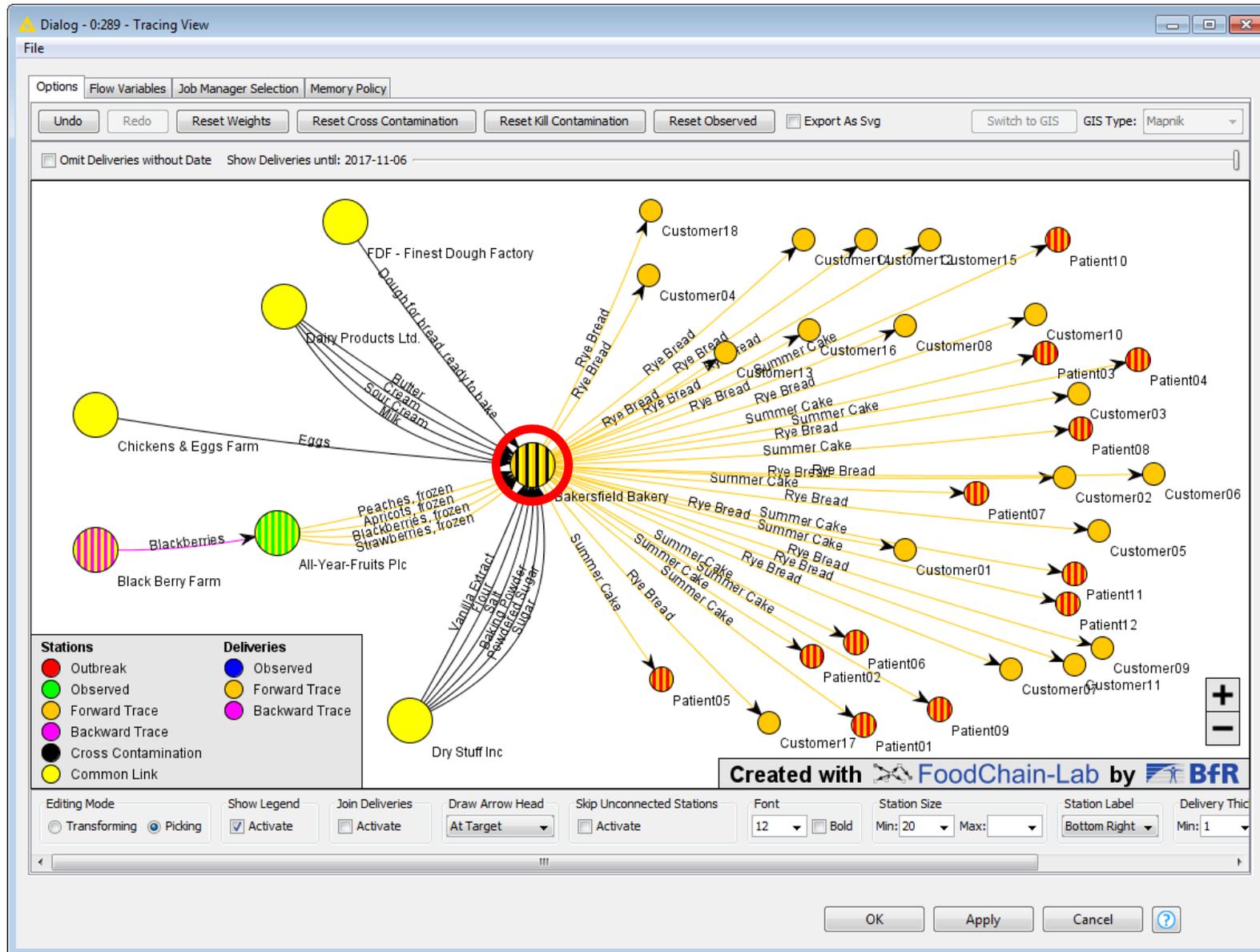
- A dialog will pop up, showing all attributes of the station.
- Additionally, it is possible to change "Weight", "Cross Contamination", "Kill Contamination" and "Observed".
- Select "Observed" and press OK.

# Step 3



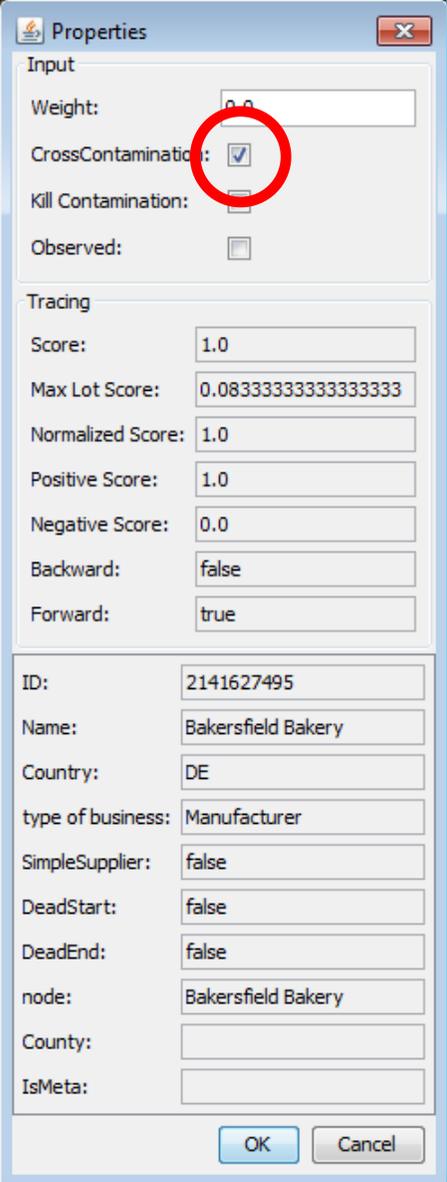
- Stations and deliveries on the forward trace are orange and the ones of the backward trace are purple. The observed station is green.
- The outbreak stations (here: patients) are striped red and orange now. This means they really are on the forward trace of the observed station.

# Step 4



- However, also stations for which no outbreak was confirmed are on the forward trace (here: customers).
- Perhaps there was one assumption to many. What happens if we deactivate “cross contamination” in the station in the red circle? Double click this station.

## Step 5



Properties

Input

Weight: 0.0

CrossContamination:

Kill Contamination:

Observed:

Tracing

Score: 1.0

Max Lot Score: 0.0833333333333333

Normalized Score: 1.0

Positive Score: 1.0

Negative Score: 0.0

Backward: false

Forward: true

ID: 2141627495

Name: Bakersfield Bakery

Country: DE

type of business: Manufacturer

SimpleSupplier: false

DeadStart: false

DeadEnd: false

node: Bakersfield Bakery

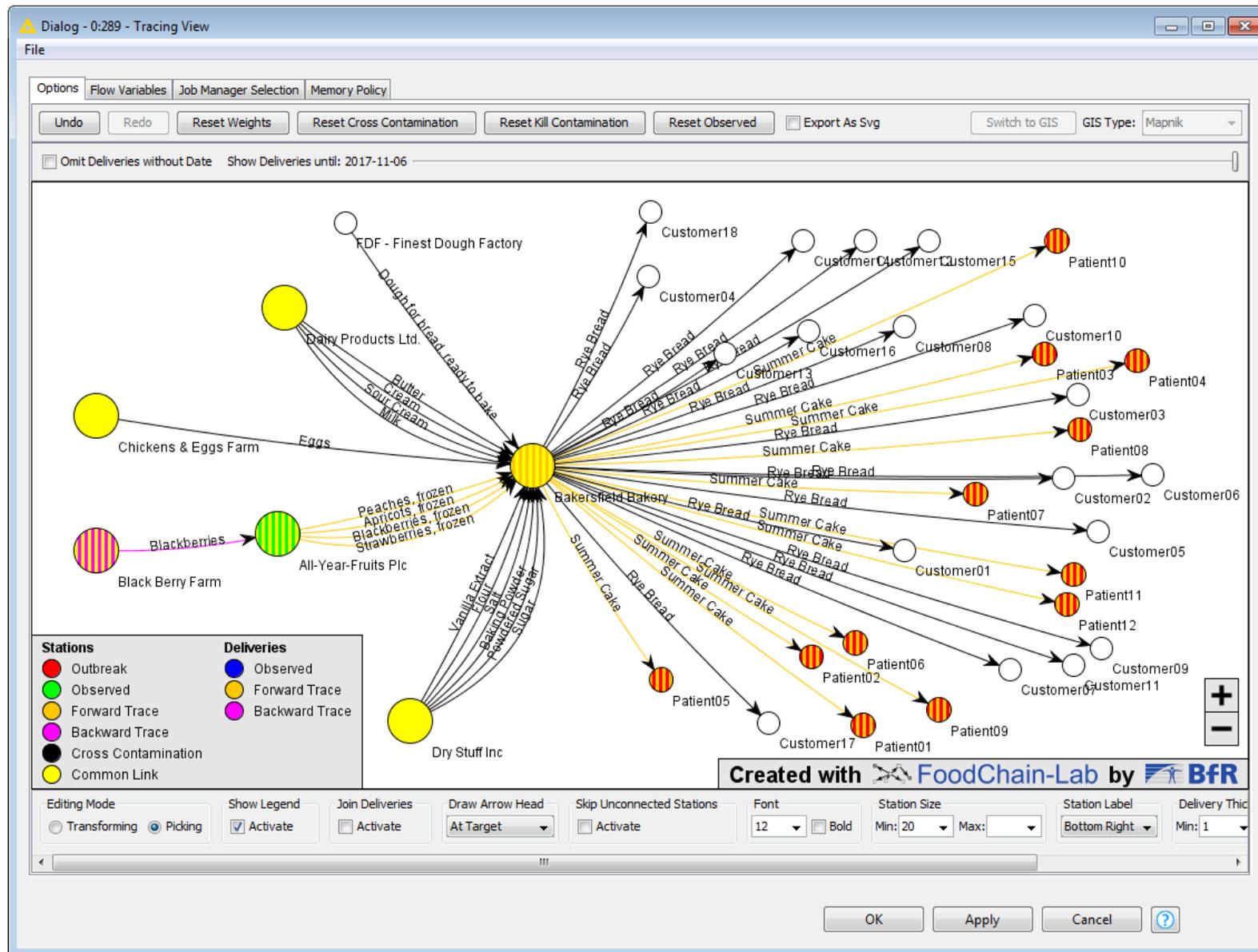
County:

IsMeta:

OK Cancel

- Uncheck “CrossContamination”. This means we assume that even if contaminated products were used by the bakery the contamination coming from one ingredient did not spread to all of the bakery’s products but only to those that contain this ingredient. Press OK.

# Step 5



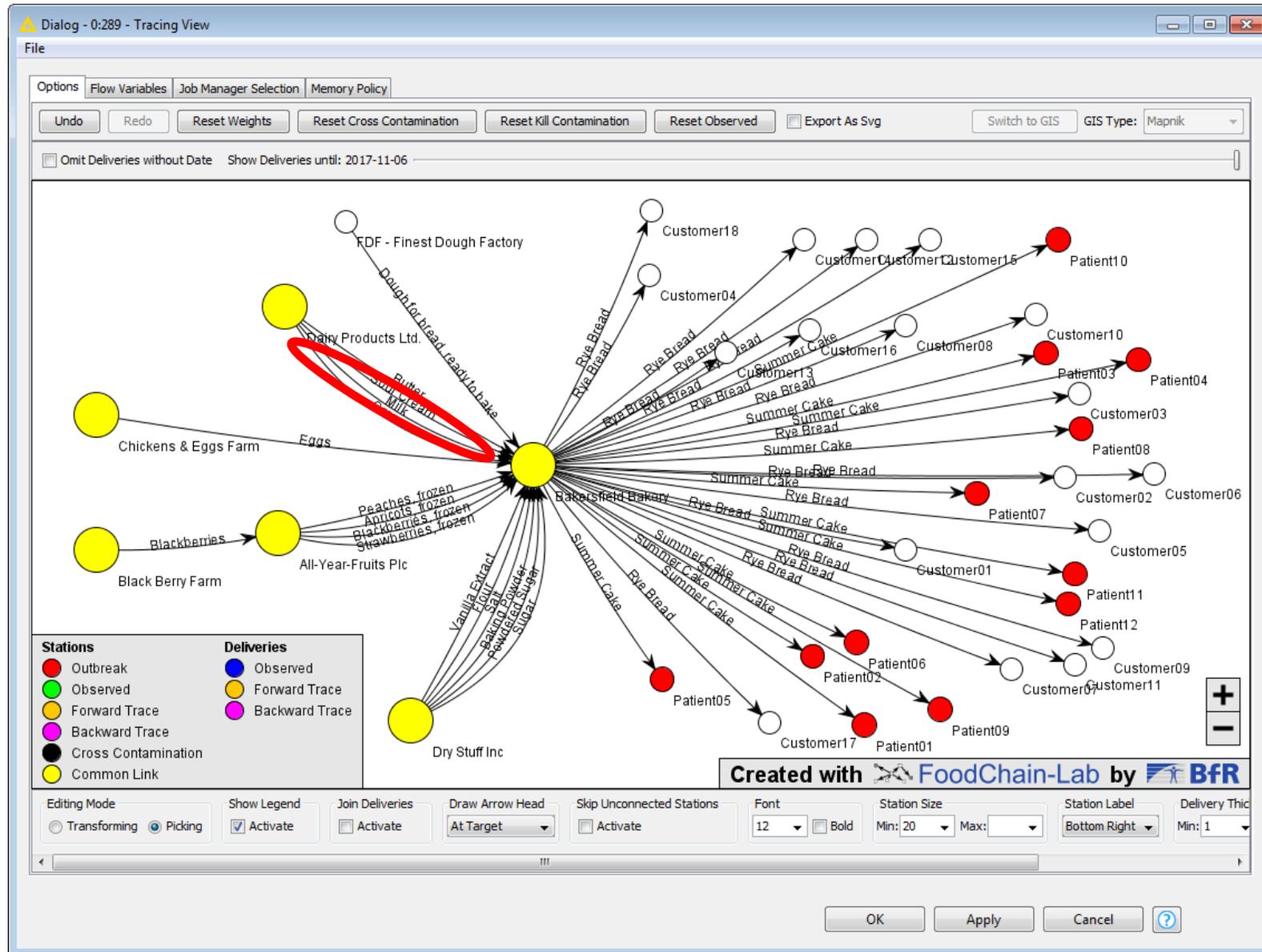
- Deactivating cross contamination changed the forward trace of the observed station.
- Now, only the outbreak stations belong to the forward trace.

## Step 5



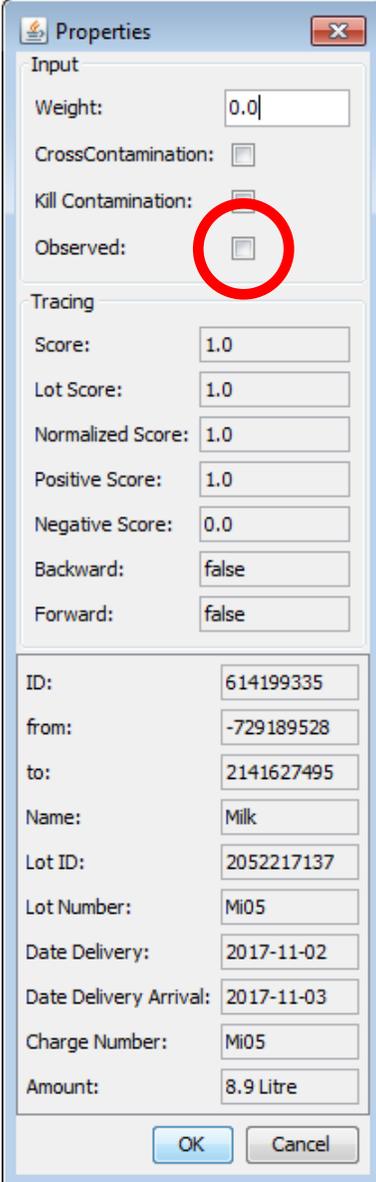
- But is *All-Year-Fruits Plc* the only possible source for contaminated products?  
Deselect “Observed” in this station and try one of the other common links.
- Also other companies might be the source of the contamination. Thus, it is not yet proven that *All-Year-Fruits Plc* delivered contaminated products.
- Perhaps it is time to take samples in these companies...
- Some days later you get the results from the laboratory. There was a high bacterial count in a milk pasteurizing machine from *Dairy Products Ltd.* as well as in milk cartons filled by this company with “pasteurized” milk. The outbreak strain and the strain found in the milk pasteurizer are identical.

# Step 6



- Uncheck “Observed” in the stations. The Tracing View should look like the screenshot above.
- Double click the delivery arrow of the milk (see red oval).

## Step 7



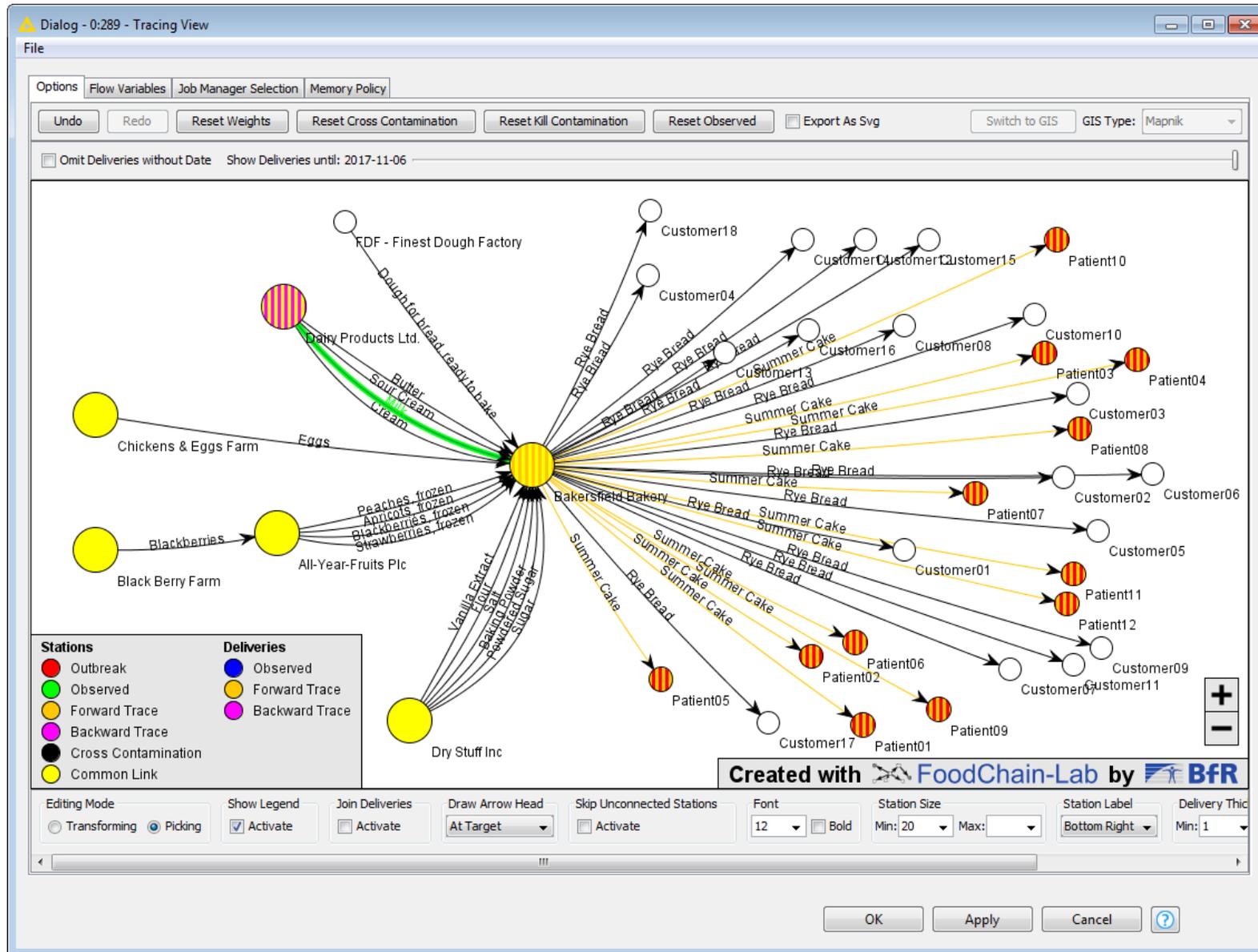
The screenshot shows a 'Properties' dialog box with the following fields and values:

Section	Field	Value
Input	Weight:	0.0
	CrossContamination:	<input type="checkbox"/>
	Kill Contamination:	<input type="checkbox"/>
	Observed:	<input checked="" type="checkbox"/>
Tracing	Score:	1.0
	Lot Score:	1.0
	Normalized Score:	1.0
	Positive Score:	1.0
	Negative Score:	0.0
	Backward:	false
	Forward:	false
General	ID:	614199335
	from:	-729189528
	to:	2141627495
	Name:	Milk
	Lot ID:	2052217137
	Lot Number:	Mi05
	Date Delivery:	2017-11-02
	Date Delivery Arrival:	2017-11-03
	Charge Number:	Mi05
	Amount:	8.9 Litre

Buttons: OK, Cancel

- Check “Observed” to see the backward and forward traces of the milk which is an ingredient of the Summer Cake consumed by all patients. Press OK.

# Step 7



- All of the outbreak stations (and these only) belong to the forward trace. You seem to have found the source of the outbreak: The milk pasteurizer in the company *Dairy Products Ltd.* If only tracing was always this easy...