CALIFORNIA AIR RESOURCES BOARD

Example Calculation for Verification of Reprocessed Tomato Product Data

for California's Mandatory Greenhouse Gas Reporting Regulation

Introduction

The following example calculation is provided by the California Air Resources Board (CARB) to verifiers of tomato processing facilities to help facilitate compliance with the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (title 17, California Code of Regulations, section 95100 et seq.) (MRR). Guidance for reporting entities is at:

https://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/tomato-product.pdf.

Background on Tomato Product Data Calculation and Reprocessing

Tomato processors receive tomatoes from tomato growers during the summer harvest and convert the raw fruit into products such as tomato paste and diced tomatoes, and retail products like salsas and pizza sauces. These products are sealed in cans, bags, drums, and other containers using either an aseptic or non-aseptic process.

If a product does not meet a product specification, the product is spoiled, or the product cannot otherwise be sold, the tomato processor may reprocess that product into a new product. An example of reprocessing could include taking aseptic tomato paste in a 600 pound bag and reprocessing it into several hundred jars of pizza sauce containing non-aseptic tomato puree.

When tomato products are reprocessed, operators are required to separately account for both tomato products produced from raw tomatoes, and production from reprocessed tomatoes that have already been counted as produced. This is because tomato products reported as covered product data may only be reported once. To avoid double-counting, the quantity of tomato products that are initially reported as produced but are subsequently reprocessed must be subtracted from the total production for the year the product was reprocessed.

Example of Reprocessed Tomato Product Data

For tomato paste that is reprocessed, the operator is required to take into account the initial quantity of tomato soluble solids (TSS) and the final TSS for paste. The quantity of whole and diced tomatoes or tomato juice that is reprocessed must also be subtracted from total production during the year it was reprocessed to avoid double-counting of covered product data.

The following illustrative example shows production information for hypothetical Facility A. Facility A produced aseptic paste in 2015, and then reprocessed the paste in 2016 to make a different product, as summarized in Table 1. As a result, the quantity of reprocessed paste must be subtracted from that same product category in order to avoid double-counting product data.

Table 1: Summary of Production Data for Facility A

	Tons (% TSS)	
	2015 Data	**2016 Data**
Aseptic Paste*	6,903 (34%)	8,658 tons (35%)
Non-aseptic Paste*	3,167 (23%)	3,802 tons (23%)
Aseptic Paste Reprocessed into Other Products**		448 tons (34%)

*Raw tomato TSS of 5% for 2015, and 5.2% for 2016.
**448 tons of aseptic paste initially produced in 2015 that was reprocessed into other products in 2016.

2015 Production

In 2015, the facility produced **6,903** tons of 34% TSS aseptic tomato paste, from raw tomatoes with TSS of 5%. As defined in MRR, aseptic paste is normalized to 31% TSS using:

Mass of tomato paste (at % normalized TSS) =

$$\text{Measured Production Quantity} \times \frac{(\text{measured TSS\%} - \text{raw TSS\%})}{(\text{normalized TSS\%} - \text{raw TSS\%})}$$

$$= 6{,}903 \text{ tons} \times \frac{(34-5)}{(31-5)}$$

= 7,700 tons aseptic tomato paste, normalized to 31% TSS.

The facility also produced **3,167** tons of 23% TSS non-aseptic paste, from raw tomatoes with TSS of 5%. As defined in MRR, non-aseptic paste is normalized to 24% TSS using:

Mass of tomato paste (at % normalized TSS) =

$$\text{Measured Production Quantity} \times \frac{(measured\ TSS\% - raw\ TSS\%)}{(normalized\ TSS\% - raw\ TSS\%)}$$

$$= 3{,}167 \times \frac{(23-5)}{(24-5)}$$

= 3,000 tons non-aseptic paste, normalized to 24% TSS.

Figure 1 shows 2015 production as would be reported for Facility A in Cal e-GGRT:

Figure 1: 2015 Production Data for Facility A

In this example, the 2015 product data would be reported and verified, and because no reprocessing of previous years' product occurred, no adjustments would be made to the production data. The example continues below where some of that paste initially produced in 2015 is reprocessed into a different product in 2016.

2016 Production

For 2016 data, Facility A produced **8,658** tons of 35% TSS aseptic tomato paste from raw tomatoes with TSS of 5%. As defined in MRR, aseptic paste is normalized to 31% using:

Mass of tomato paste (at % normalized TSS) =

$$\text{Measured Production Quantity} \times \frac{(measured\ TSS\% - raw\ TSS\%)}{(normalized\ TSS\% - raw\ TSS\%)}$$

$$= 8{,}658 \text{ tons} \times \frac{(35-5.2)}{(31-5.2)}$$

= 10,000 tons aseptic tomato paste, normalized to 31% TSS.

However, **448** tons of 34% TSS aseptic paste produced in 2015 was reprocessed in 2016. For accounting purposes, and to avoid double-counting product that was already reported in the previous year, the reprocessed aseptic paste must be normalized to 31% TSS, and then subtracted from the normalized total production of aseptic paste for 2016 using:

Mass of reprocessed tomato paste (at % normalized TSS) =

$$\text{Mass reprocessed tomato} \times \frac{(measured\ TSS\% - raw\ TSS\%)}{(normalized\ TSS\% - raw\ TSS\%}$$

$$= 448 \text{ tons} \times \frac{(34-5)}{(31-5)}$$

= 500 tons aseptic tomato paste reprocessed, normalized to 31% TSS.

Total Reportable 31% TSS Aseptic Paste in 2016 =

Total Aseptic Paste - Reprocessed Aseptic Paste

= 10,000 - 500

= 9,500 tons

Note that the 500 tons that is reprocessed would always be subtracted, irrespective of losses that subsequently occur during reprocessing. Any difference between the theoretical and actual tons of production represents wasted product attributed to spillage and would not be reported as covered product data.

The facility also produced **3,802** tons of 23% TSS Non-aseptic Paste from raw tomatoes with TSS of 5.2%. As defined in MRR, non-aseptic paste is normalized to 24% TSS using:

Mass of reprocessed tomato paste (at % normalized TSS) =

Mass reprocessed tomato x $\frac{(measured\ TSS\% - raw\ TSS\%)}{(normalized\ TSS\% - raw\ TSS\%)}$

= 3,802 x $\frac{(23-5.2)}{(24-5.2)}$

= 3,600 tons non-aseptic paste, normalized to 24% TSS.

Figure 2 shows 2016 production as would be reported for Facility A in Cal e-GGRT:

Figure 2: 2016 Production Data for Facility A

Annual production of aseptic tomato paste (covered product data)	9500	(short tons of 31% TSS)
Annual production of aseptic whole and diced tomato (covered product data)		(short tons)
Annual production of non-aseptic tomato paste and tomato puree (covered product data)	3600	(short tons of 24% TSS)
Annual production of non-aseptic whole and diced tomato (covered product data)		(short tons)
Annual production of non-aseptic tomato juice (covered product data)		(short tons)

To avoid the complication of accounting for reprocessed product data, the operator has the option of simplifying the reporting by only reporting initially produced products. This is only a viable option if the reprocessed product is separately produced and not inter-mixed with regularly produced tomato products, as is the case if reprocessing occurs separately from raw tomato processing.