

1. --- Replaced invalid or blank item names using the price to identify the correct item (Discretion applied) ---

```
=IF(
  OR(B2="ERROR", B2="EMPTY", B2="UNKNOWN", B2=""),
  SWITCH(E2,
    1, "Cookie",
    2, "Coffee",
    3, "Cake",
    4, "Sandwich",
    5, "Salad",
    1.5, "Tea",
    "X"
  ),
  B2
)
```

2. --- Recalculated Total Spent with Quantity × Price (if it's missing or invalid) ---

```
=IF(
  OR(F2="ERROR", F2="EMPTY", F2="Unknown", F2=""),
  IF(AND(ISNUMBER(D2), ISNUMBER(E2)), D2 * E2, 0),
  F2
)
```

3. --- Checked the total number of missing or incorrect item name entries ---

```
=COUNTIF(B2:B10001, "ERROR") + COUNTIF(B2:B10001, "UNKNOWN") +
COUNTBLANK(B2:B10001)
```

4. --- Fixed missing Price Per Unit using Item name where the price is invalid ---

```
=IF(
  OR(E2="ERROR", E2="EMPTY", E2="UNKNOWN", E2=""),
  SWITCH(C2,
    "Cookie", 1,
    "Coffee", 2,
    "Cake", 3,
    "Juice", 3,
    "Sandwich", 4,
    "Smoothie", 4,
    "Salad", 5,
    "Tea", 1.5,
    0
  ),
  E2)
```

5. --- Assigned value to Price Per Unit column using either item name or $\text{Total} \div \text{Quantity}$ if name isn't recognized ---

```
=IF(
  OR(E2="ERROR", E2="EMPTY", E2="UNKNOWN", E2=""),
  SWITCH(C2,
    "Cookie", 1,
    "Coffee", 2,
    "Cake", 3,
    "Juice", 3,
    "Sandwich", 4,
    "Smoothie", 4,
    "Salad", 5,
```

"Tea", 1.5,
IF(AND(ISNUMBER(F2), ISNUMBER(D2)), F2 / D2, 0)
,
E2)

6. --- Recalculated the missing Quantity using Total Spent ÷ Price Per Unit ---

=IF(
OR(D2="ERROR", D2="EMPTY", D2="Unknown", D2=""),
IF(AND(ISNUMBER(F2), ISNUMBER(E2)), F2 / E2, 0),
D2
)

7. --- Replaced zero Quantity with calculated values when Price Per Unit and Total Spent are present.

=IF(AND(D2=0, F2>0, E2>0), F2 / E2, D2)

8. --- Recalculated Total Spent if value is 0 but Quantity and Price Per Unit exist ---

=IF(AND(F2=0, D2>0, E2>0), D2 * E2, F2)

9. --- Marked bad payment method entries as "Missing" ---

=IF(
OR(G2="", G2="EMPTY", G2="ERROR", G2="UNKNOWN"),
"Missing",
G2
)

10. --- Cleared invalid or empty date fields to prevent errors in time-based analysis ---

```
=IF(  
  OR(H2="", H2="EMPTY", H2="ERROR", H2="UNKNOWN"),  
  "",  
  H2  
)
```