Topic: Milk Supply System

Aim :

To design and develop a Milk Supply Management System (MSMS) that enhances the efficiency and accuracy of milk collection, distribution, and record-keeping processes, ultimately leading to improved service delivery to dairy farmers and consumers. The MSMS aims to incorporate real-time data updates and seamless integration of milk-related information to minimize discrepancies, streamline operations, and support data-driven decision-making in the dairy industry.

Website :

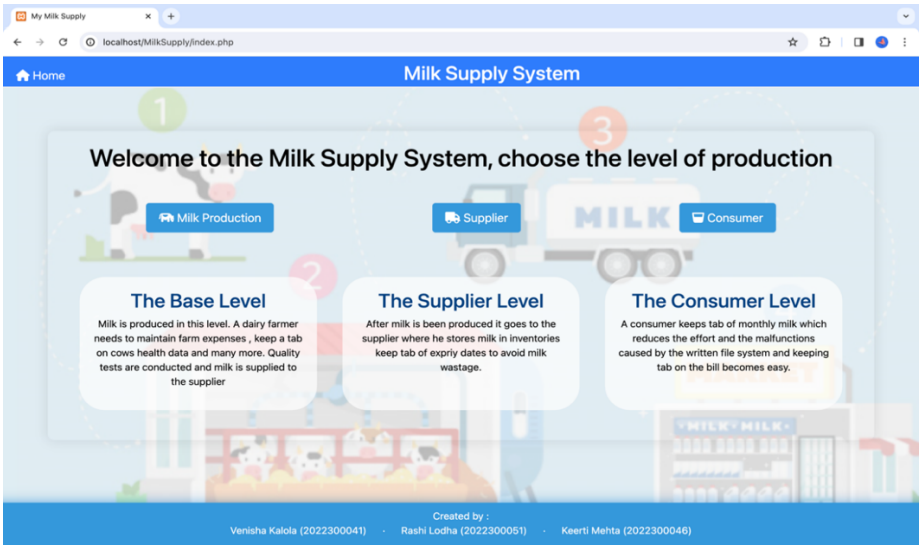
The Milk Supply Management System (MSMS) is a robust solution designed to optimize milk collection, distribution, and record-keeping. Utilizing Vanilla JS, PHP, and CSS frameworks, the website ensures efficiency and accuracy, carefully checking constraints related to database tables. Employing an Apache web server and localhost, xampp, the system ensures seamless data insertion and updates while prioritizing data integrity.

The homepage, serving as a central hub, features three main functionalities:

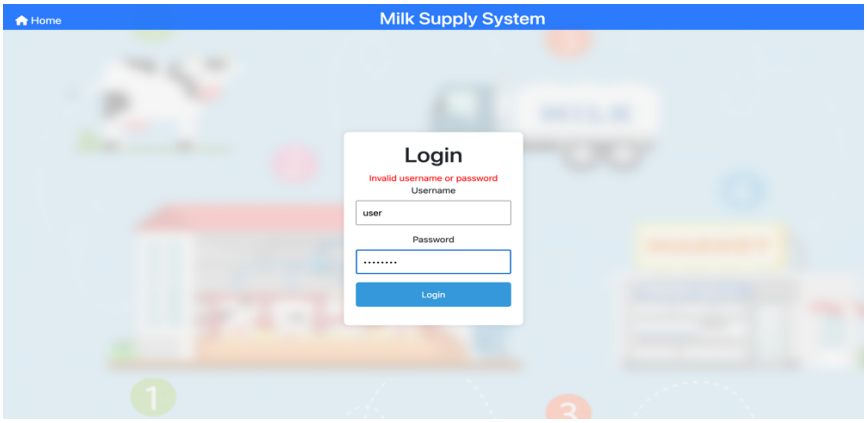
1. **Milk Production:** Offers a detailed financial overview, addressing farm expenses and supporting stakeholders in understanding dairy operations' financial aspects.
2. **Supplier:** Manages real-time dairy product inventory, providing a comprehensive view of available products and quantities.
3. **Consumer:** Enables users to customize and manage product preferences.

The system includes user login functionality, ensuring secure access and enhancing overall system security. The MSMS is dedicated to improving service delivery by incorporating real-time data updates, streamlining operations, and supporting data-driven decision-making in the dynamic dairy industry.

Home Page :



As soon as we click on any of the level we get a login page which displays error message if not valid user or invalid password is entered.



Storing login data in database

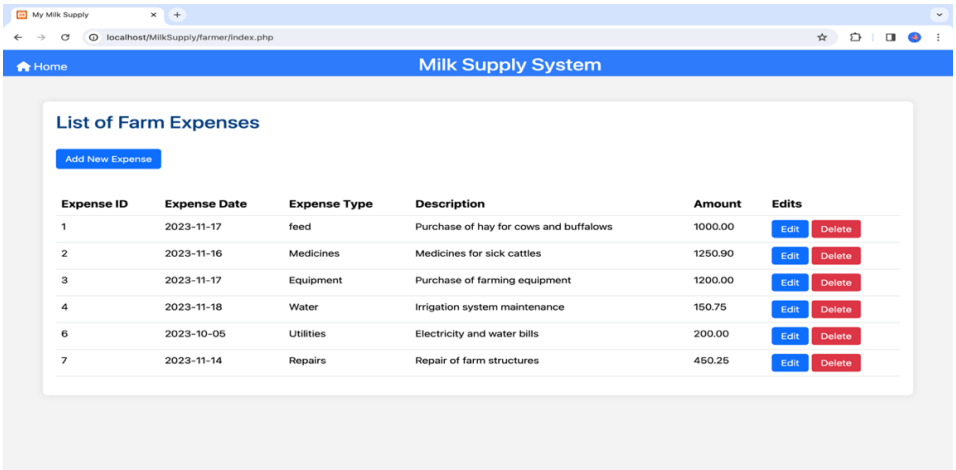
```
mysql> select* from users_farmer;
+----+--------------+----------+
| id | username     | password |
+----+--------------+----------+
|  1 | Dairy Farmer | Farmer   |
+----+--------------+----------+
1 row in set (0.00 sec)

mysql> select* from users_suppliers;
+----+----------------+----------+
| id | username       | password |
+----+----------------+----------+
|  1 | Supplier       | Supplier |
|  2 | Dairy Supplier | Supplier |
+----+----------------+----------+
2 rows in set (0.00 sec)

mysql> select* from users_consumer;
+----+----------+----------+
| id | username | password |
+----+----------+----------+
|  1 | Consumer | Consumer |
|  2 | Customer | Consumer |
+----+----------+----------+
2 rows in set (0.01 sec)
```

On right login we enter to respective tables of all that particular level

Testing CRUD operations :

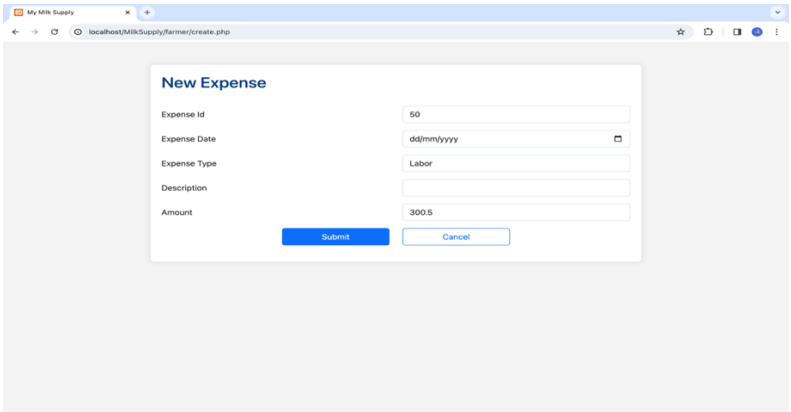
1.**Insert** : Insert new Expense with id 50 for type labor in Farm Expense (Milk Production)

Before :

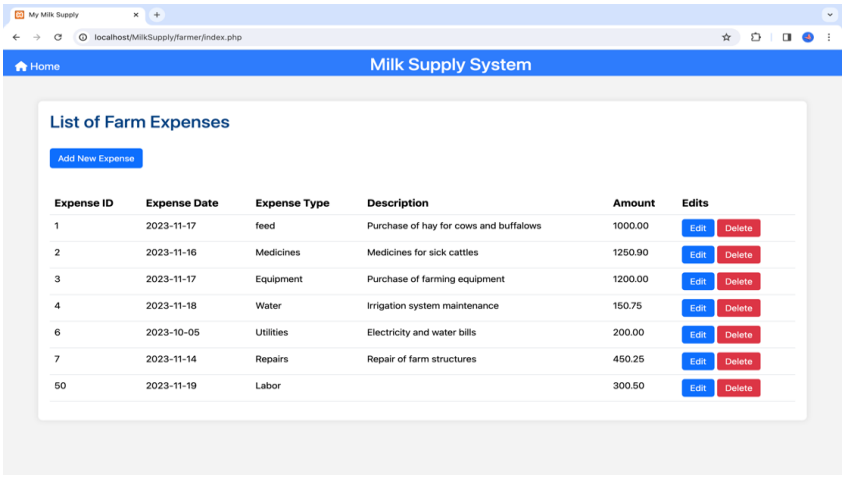



```
mysql> select* from FarmExpenses;
+-----------+-------------+-------------+-------------------------------------+---------+
| ExpenseID | ExpenseDate | ExpenseType | ExpenseDescription                  | Amount  |
+-----------+-------------+-------------+-------------------------------------+---------+
|         1 | 2023-11-17  | feed        | Purchase of hay for cows and buffalows | 1000.00 |
|         2 | 2023-11-16  | Medicines   | Medicines for sick cattles          | 1250.90 |
|         3 | 2023-11-17  | Equipment   | Purchase of farming equipment       | 1200.00 |
|         4 | 2023-11-18  | Water       | Irrigation system maintenance       |  150.75 |
|         6 | 2023-10-05  | Utilities   | Electricity and water bills         |  200.00 |
|         7 | 2023-11-14  | Repairs     | Repair of farm structures           |  450.25 |
+-----------+-------------+-------------+-------------------------------------+---------+
6 rows in set (0.00 sec)

mysql>
```

Process : Adding a new expense record .
This user interface component represents a form within the Milk Supply system, specifically designed for farmers to input details of a new expense related to milk production



Output : After performing the insertion operation, it has been observed that a new expense record has been added to the Farm Expenses table. Date has default constraint so we get that days date as input.

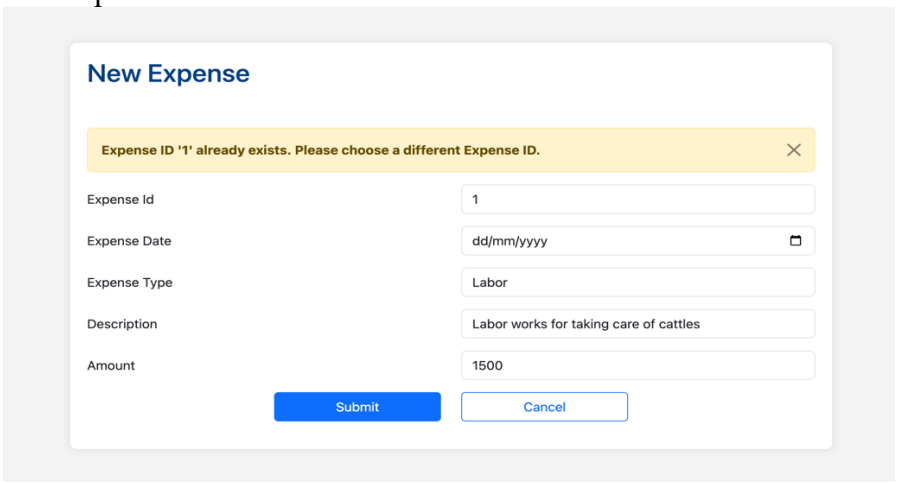


(in database) :

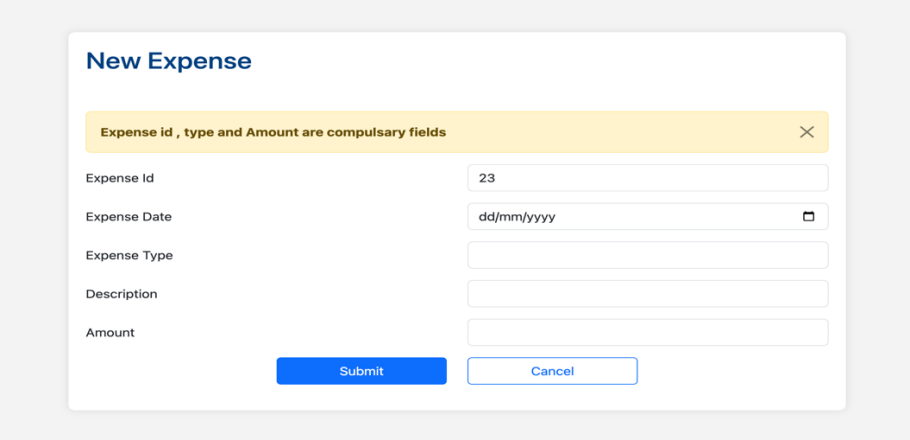
```
mysql> select* from FarmExpenses;
+-----------+-------------+-------------+-------------------------------------+---------+
| ExpenseID | ExpenseDate | ExpenseType | ExpenseDescription                  | Amount  |
+-----------+-------------+-------------+-------------------------------------+---------+
|         1 | 2023-11-17  | feed        | Purchase of hay for cows and buffalows | 1000.00 |
|         2 | 2023-11-16  | Medicines   | Medicines for sick cattles          | 1250.90 |
|         3 | 2023-11-17  | Equipment   | Purchase of farming equipment       | 1200.00 |
|         4 | 2023-11-18  | Water       | Irrigation system maintenance       |  150.75 |
|         6 | 2023-10-05  | Utilities   | Electricity and water bills         |  200.00 |
|         7 | 2023-11-14  | Repairs     | Repair of farm structures           |  450.25 |
|        50 | 2023-11-19  | Labor       | NULL                                |  300.50 |
+-----------+-------------+-------------+-------------------------------------+---------+
7 rows in set (0.00 sec)

mysql>
```

Checking Constraints :

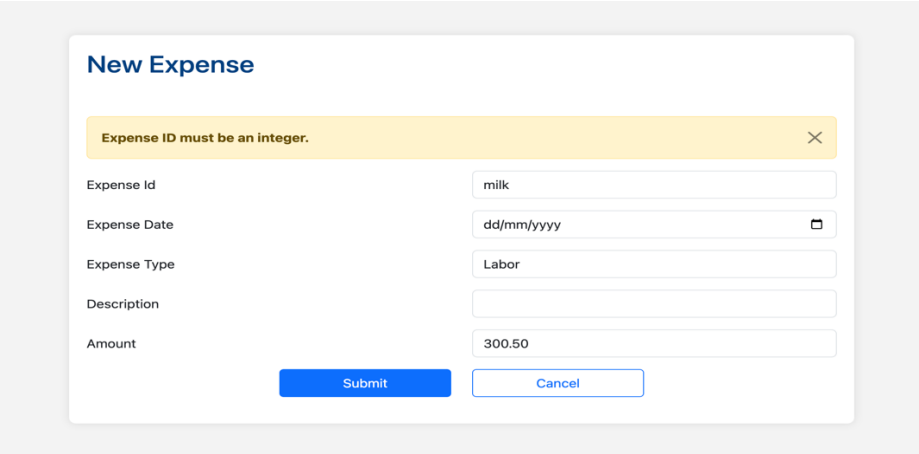
1.Trying to insert same primary key – we get error message as primary key cannot be same hence new expense id cannot be same



2. Not filling any data except primary key and submitting form – we get error message as database has constraint of not null for the particular fields

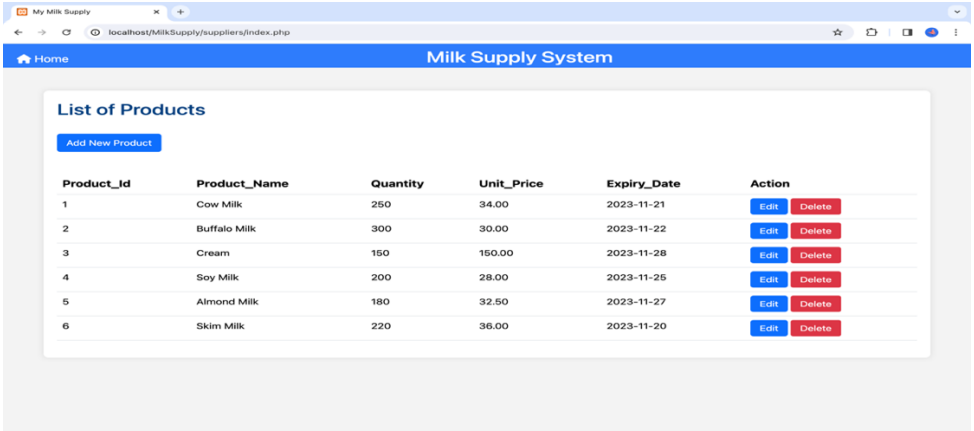


3. Adding Expense id as not an integer – we get error message as expense id is declared int in database so we cannot add a non integer value



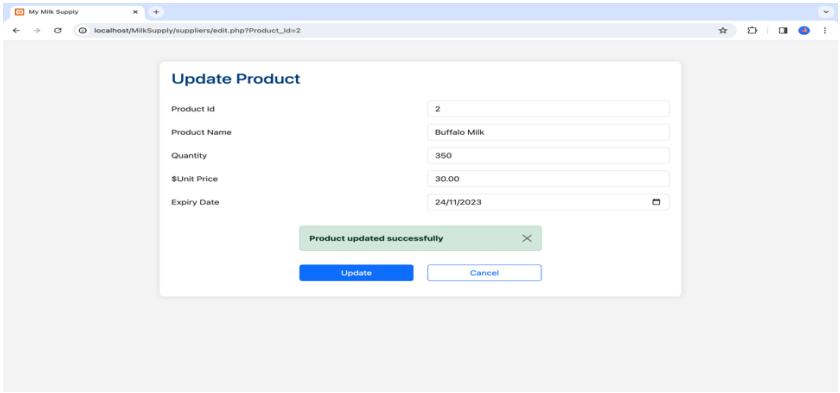
2. **Update :** Update quantity to 350 and expiry date to 24 for product id 2 in Supplier level

Before :



```
mysql> select* from Product_Inventory;
+------------+--------------+----------+------------+-------------+
| Product_Id | Product_Name | Quantity | Unit_Price | Expiry_Date |
+------------+--------------+----------+------------+-------------+
|          1 | Cow Milk     |      250 |      34.00 | 2023-11-21  |
|          2 | Buffalo Milk |      300 |      30.00 | 2023-11-22  |
|          3 | Cream        |      150 |     150.00 | 2023-11-28  |
|          4 | Soy Milk     |      200 |      28.00 | 2023-11-25  |
|          5 | Almond Milk  |      180 |      32.50 | 2023-11-27  |
|          6 | Skim Milk    |      220 |      36.00 | 2023-11-20  |
+------------+--------------+----------+------------+-------------+
6 rows in set (0.00 sec)

mysql>
```

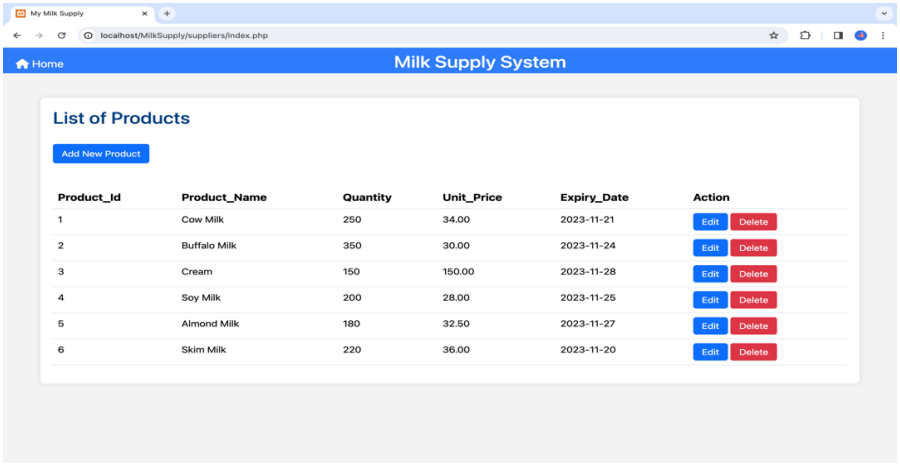
Process: Updating a Product record in the Product Inventory table
This user interface component represents a form within the Milk Supply system, specifically designed for suppliers to update details of milk and its products.



Output : After performing the update operation, it has been observed that a Product record has been updated in the Product Inventory table.

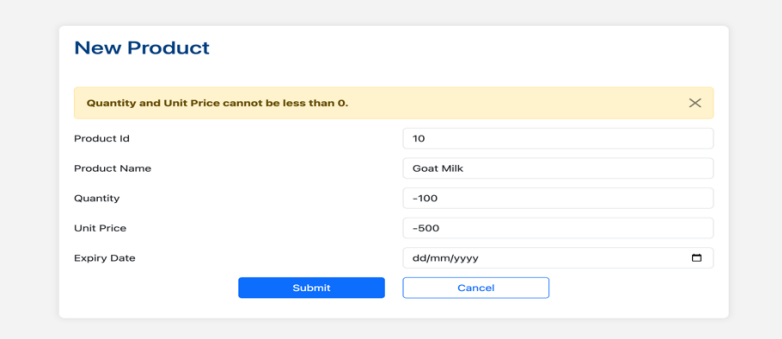
(In database):

```
mysql> select* from Product_Inventory;
+------------+--------------+----------+------------+-------------+
| Product_Id | Product_Name | Quantity | Unit_Price | Expiry_Date |
+------------+--------------+----------+------------+-------------+
|          1 | Cow Milk     |      250 |      34.00 | 2023-11-21  |
|          2 | Buffalo Milk |      350 |      30.00 | 2023-11-24  |
|          3 | Cream        |      150 |     150.00 | 2023-11-28  |
|          4 | Soy Milk     |      200 |      28.00 | 2023-11-25  |
|          5 | Almond Milk  |      180 |      32.50 | 2023-11-27  |
|          6 | Skim Milk    |      220 |      36.00 | 2023-11-20  |
+------------+--------------+----------+------------+-------------+
6 rows in set (0.01 sec)

mysql>
```

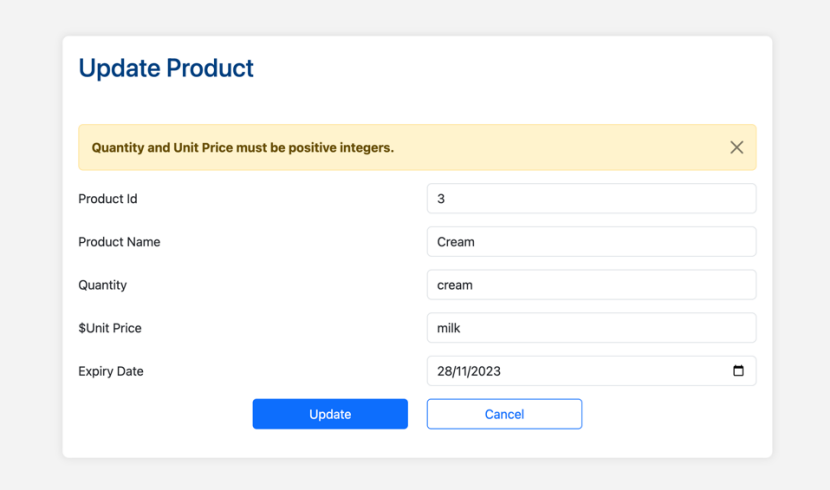


Checking Constraints :

1. Updating price and quantity to negative amount – we get error message as price and quantity should not be less than 0 and sql database has a check for it

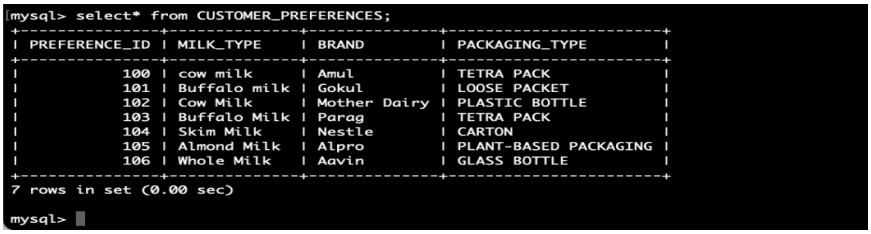


2. Trying to enter have price and quantity as not numeric values- we get error message as in database both these values are declared as numeric values so we cannot enter alphabets in it.

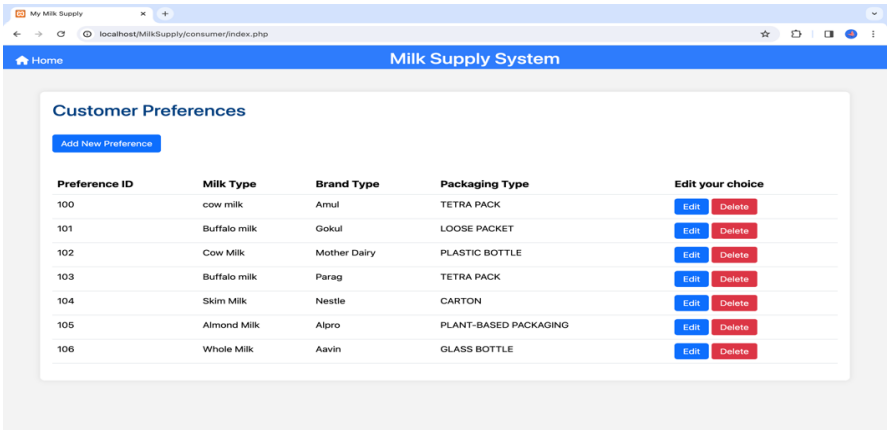


3. **Delete :** Delete id 103 in the consumer level i.e. the customer preference

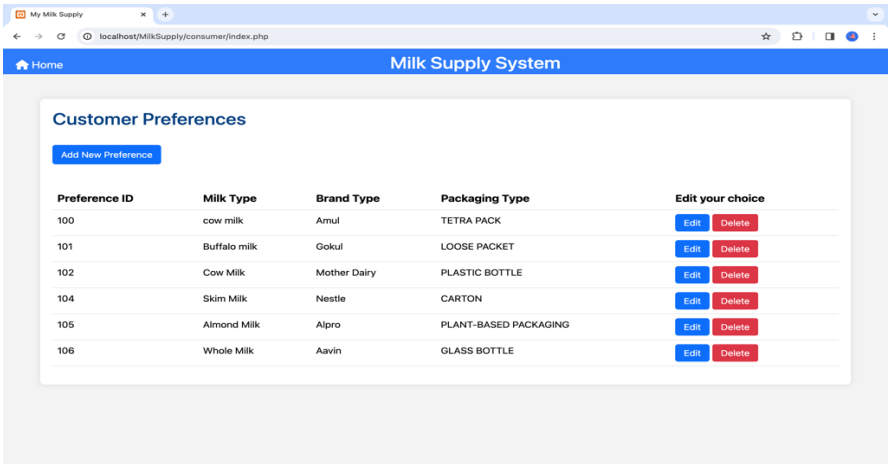
Before :



```
mysql> select* from CUSTOMER_PREFERENCES;
+---------------+-------------+--------------+-----------------------+
| PREFERENCE_ID | MILK_TYPE   | BRAND        | PACKAGING_TYPE        |
+---------------+-------------+--------------+-----------------------+
|           100 | cow milk    | Amul         | TETRA PACK            |
|           101 | Buffalo milk | Gokul       | LOOSE PACKET          |
|           102 | Cow Milk    | Mother Dairy | PLASTIC BOTTLE        |
|           103 | Buffalo Milk | Parag       | TETRA PACK            |
|           104 | Skim Milk   | Nestle       | CARTON                |
|           105 | Almond Milk | Alpro        | PLANT-BASED PACKAGING |
|           106 | Whole Milk  | Aavin        | GLASS BOTTLE          |
+---------------+-------------+--------------+-----------------------+
7 rows in set (0.00 sec)

mysql>
```



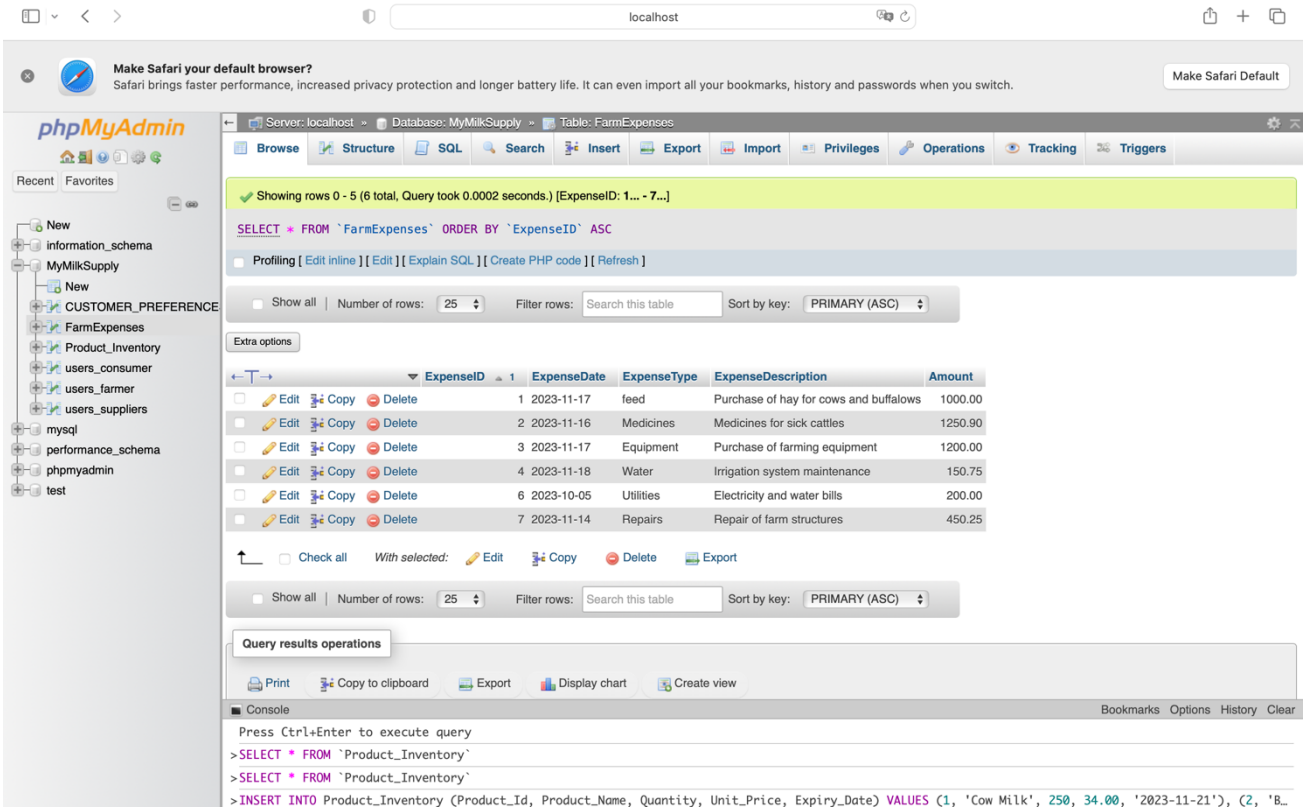
After :



(in database) :

```
mysql> select* from CUSTOMER_PREFERENCES;
+---------------+-------------+-------------+----------------------+
| PREFERENCE_ID | MILK_TYPE   | BRAND       | PACKAGING_TYPE       |
+---------------+-------------+-------------+----------------------+
|           100 | cow milk    | Amul        | TETRA PACK           |
|           101 | Buffalo milk | Gokul       | LOOSE PACKET         |
|           102 | Cow Milk    | Mother Dairy | PLASTIC BOTTLE       |
|           104 | Skim Milk   | Nestle      | CARTON               |
|           105 | Almond Milk | Alpro       | PLANT-BASED PACKAGING |
|           106 | Whole Milk  | Aavin       | GLASS BOTTLE         |
+---------------+-------------+-------------+----------------------+
6 rows in set (0.00 sec)

mysql>
```

All data connected to phpMyAdmin so we can access data through it online also



Future Scope :

In the future development of the Milk Supply Management System (MSMS), key considerations should be given to enhancing concurrent user access and expanding the system to accommodate a diverse user base. Implementation of advanced database access controls, user authentication with role-based permissions, and robust session management will enable multiple users, including suppliers and consumers, to interact with the system simultaneously while ensuring data security and integrity. Additionally, adopting scalable hosting infrastructure, load balancing, and database sharding will be essential for accommodating increased user traffic and ensuring optimal performance. Furthermore, the integration of caching mechanisms can be explored to enhance the efficiency of data retrieval for frequently accessed information. This future scope aims to provide a seamless and scalable user experience for stakeholders in the dairy industry, supporting the MSMS's evolution into a widely accessible and efficient platform.