

MyAllergyAssistant - User Manual

'MyAllergyAssistant - Android app to scan food ingredients for allergens'

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Abstract

MyAllergyAssistant is an Android app that allows users to scan or search for a product and be informed if the product is safe for them to eat or not based on their account allergens. Users will also receive alerts if a product they have previously scanned is reported by another user for containing unlisted allergens. The app was developed using React Native with TypeScript for the frontend and a combination of AWS services for the backend, including Lambda, DynamoDB, Cognito, SNS.

Declaration

We declare that this material, which we now submit for assessment, is entirely our own work and has not been taken from the work of others, save and to the extent that such work has been cited and acknowledged within the text of our work. In our README.md, we outline which source files were created and modified by us. We understand that plagiarism, collusion, and copying are grave and serious offences in the university and accept the penalties that would be imposed should we engage in plagiarism, collusion or copying. We have read and understood the Assignment Regulations. We have identified and included the source of all facts, ideas, opinions, and viewpoints of others in the assignment references. Direct quotations from books, journal articles, internet sources, module text, or any other source whatsoever are acknowledged and the source cited in the assignment references. This assignment, or any part of it, has not been previously submitted by us or any other person for assessment on this or any other course of study. We have read and understood the referencing guidelines found at <http://www.dcu.ie/info/regulations/plagiarism.shtml>, <https://www4.dcu.ie/students/az/plagiarism> and/or recommended in the assignment guidelines.

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1. Installation Guide

1.1. Prerequisites

- Android device with a camera
- Internet connection

1.2. Downloading the app via APK

You can download the release APK of our app, by visiting the following the Google Drive link on your Android device:

https://drive.google.com/file/d/1lsLh5KXE5lw9Zrdraig_EZ_1EL4J3E2k/view?usp=share_link

1.3. Running the app locally

Alternatively, if you would like to run this app locally, you must follow these steps:

1. Clone our git repository

```
git clone  
https://gitlab.com/computing.dcu.ie/eskandg2/2023-ca400-eskandg2-prizemd2.git
```

2. Navigate to the ‘src/frontend’ folder

```
cd 2023-ca400-eskandg2-prizemd2/src/frontend
```

3. Install the required dependencies.

```
npm install
```

4. Connect your Android device via USB
5. Run the local metro server

```
npm start
```

6. Install the app onto your connected Android device

```
npm run android
```

2. Using the App

2.1. Accepting App Permissions

Camera Permissions

MyAllergyAssistant requires access to your device's camera to function correctly, so there will be a popup requesting access to your camera, as seen in the image below. Note: None of the images that you take while using the app are stored. The camera is needed to scan product barcodes and ingredients.

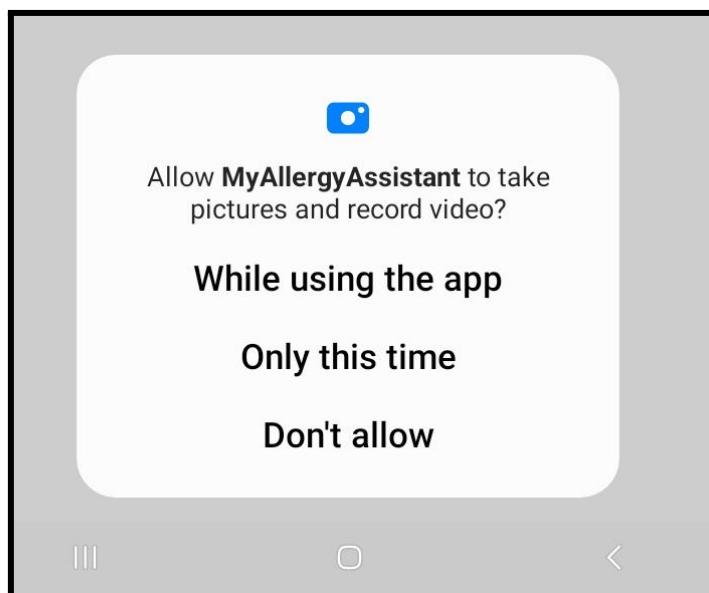


Figure 1.

Notifications permissions

When you first open the app, you will also see a popup requesting you to allow MyAllergyAssistant to send you notifications, as seen in the image below. This is needed so that you can be alerted when a product that you previously scanned is reported by another user.

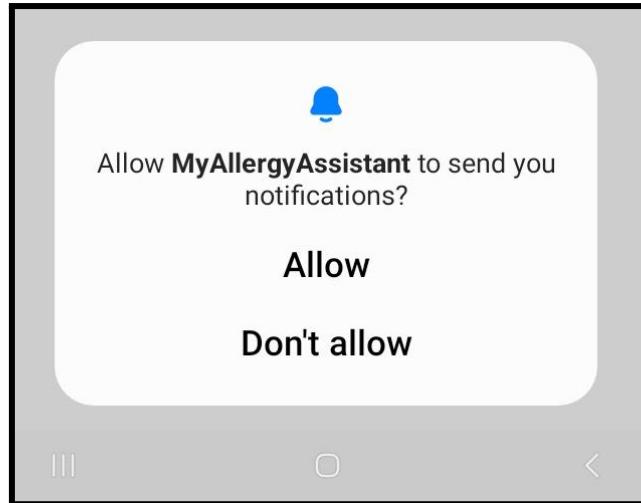


Figure 2.

Note: If you do not allow notifications permissions, then you will see the following message on the Alerts screen, requesting you to enable notifications.

You can press the 'Enable notifications' text to be brought to the MyAllergyAssistant settings page of your device's settings app.

Notification permissions must be enabled to receive alerts. Enable notifications

Figure 3.

Settings



App info

Home screen

Layout • App icon badges

Lock screen

Screen lock type

Security and privacy

Biometrics • Permission manager

Location

Location requests

Safety and emergency

Medical info

Accounts and backup

Manage accounts • Smart Switch

Google

Google services

Advanced features

Labs • Side key

Digital Wellbeing and parental controls

Screen time • App timers

Battery and device care

Storage • Memory • Device protection

Apps

Default apps • App settings



MyAllergyAssistant

Installed

Privacy

Notifications

Blocked

Permissions

Camera

Screen time

Remove permissions if app is unused



Defaults

Set as default

In this app

Usage

Mobile data

55.06 MB used since 5 Apr

Battery

0% used since last fully charged

Storage

401 MB used in Internal storage

Appear on top

Off

App details in store

App downloaded from Drive



Open



Uninstall



Force stop



Figure 4.

2.2. Account

2.2.1. Registration

Getting started, if you want to create an account you can begin by pressing ‘Create Account’. Alternatively you can press ‘Sign in with Google’ to create an account and skip the instructions below and follow the **Setup** instructions.

Once you’ve done that, you will then be brought to another form asking for your email address and password to be filled in twice. Ensure your details are valid, such as your email address which must be valid for verification and your password must contain 8 characters. Once you’ve filled in the details, press ‘Create Account’.

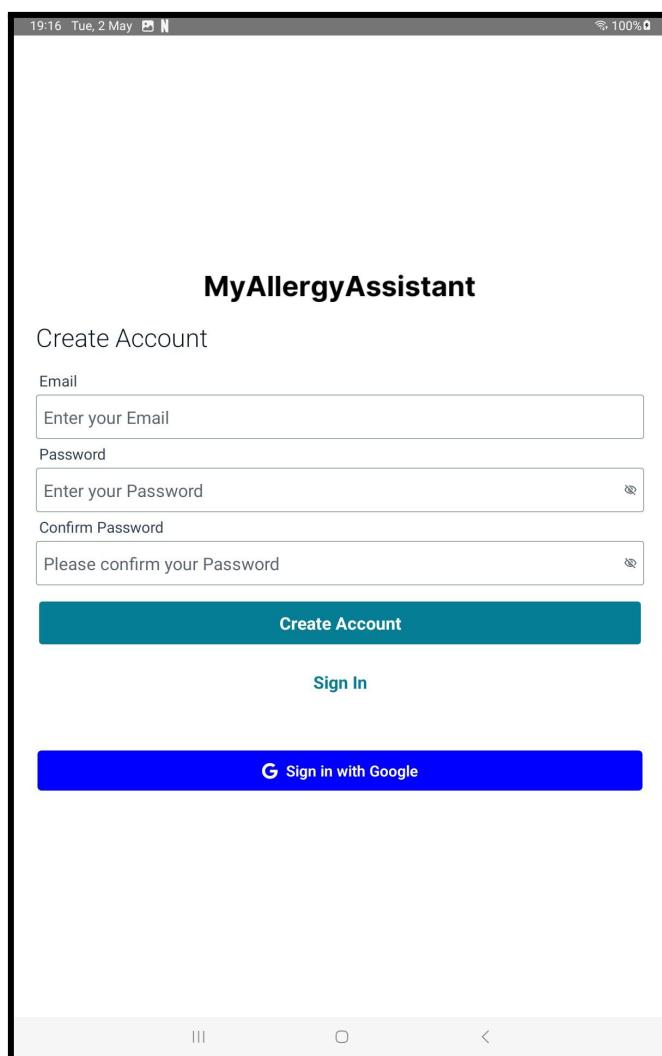


Figure 5.

Once you’ve done that, you will be brought to a form for verification, you should have received a verification code from no-reply@verificationemail.com, if you can’t find it check if it’s in spam or press ‘Resend Code’.

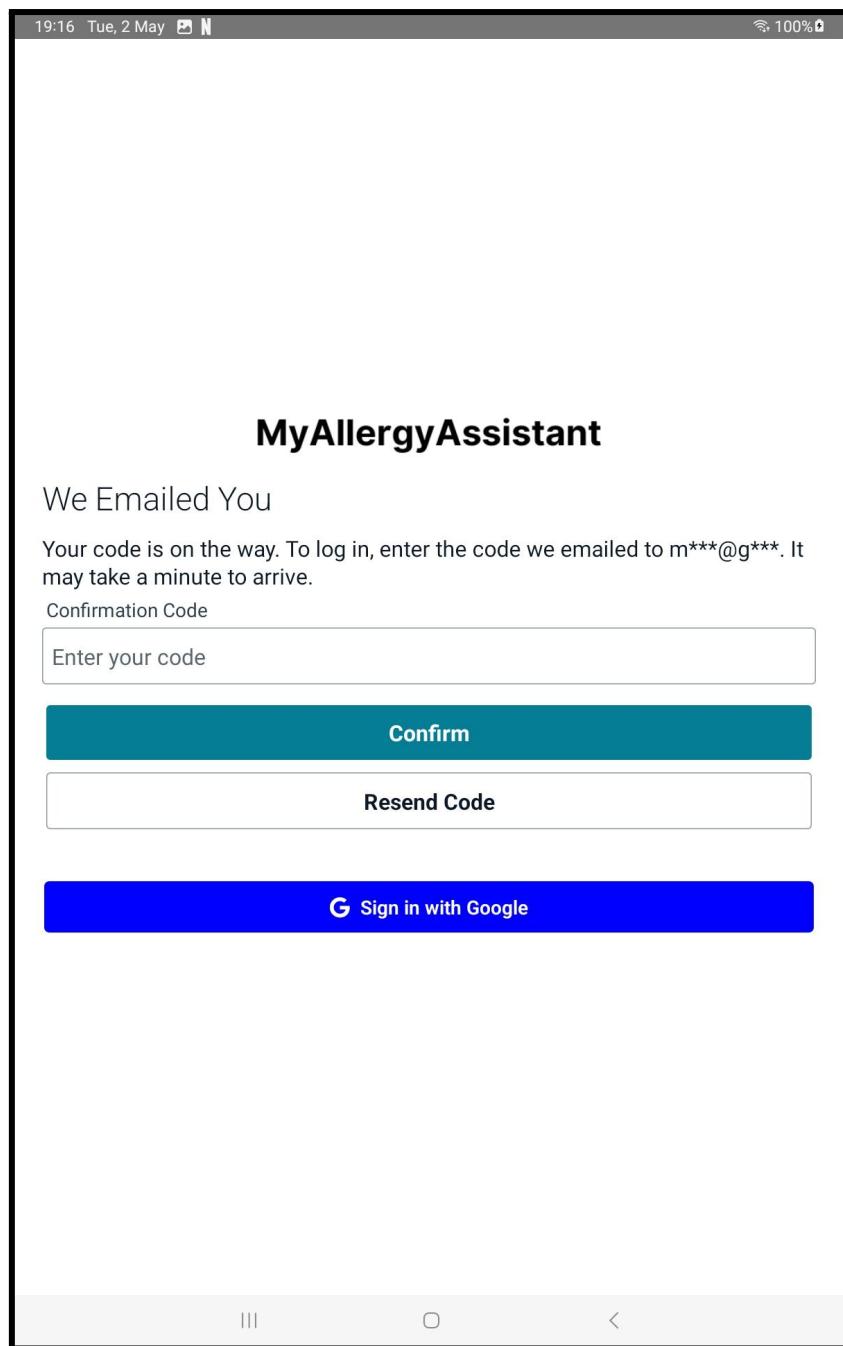


Figure 6.

Enter the code and press confirm, if successful, you will be brought to the setup screen.

2.2.2. Account Setup - Selecting your Allergens

Before you start scanning, you are required to set up your allergy profile. You can search for your allergies in the search bar and check their checkbox(es) to include them in your profile. Your allergy profile can be changed at any time after setup.

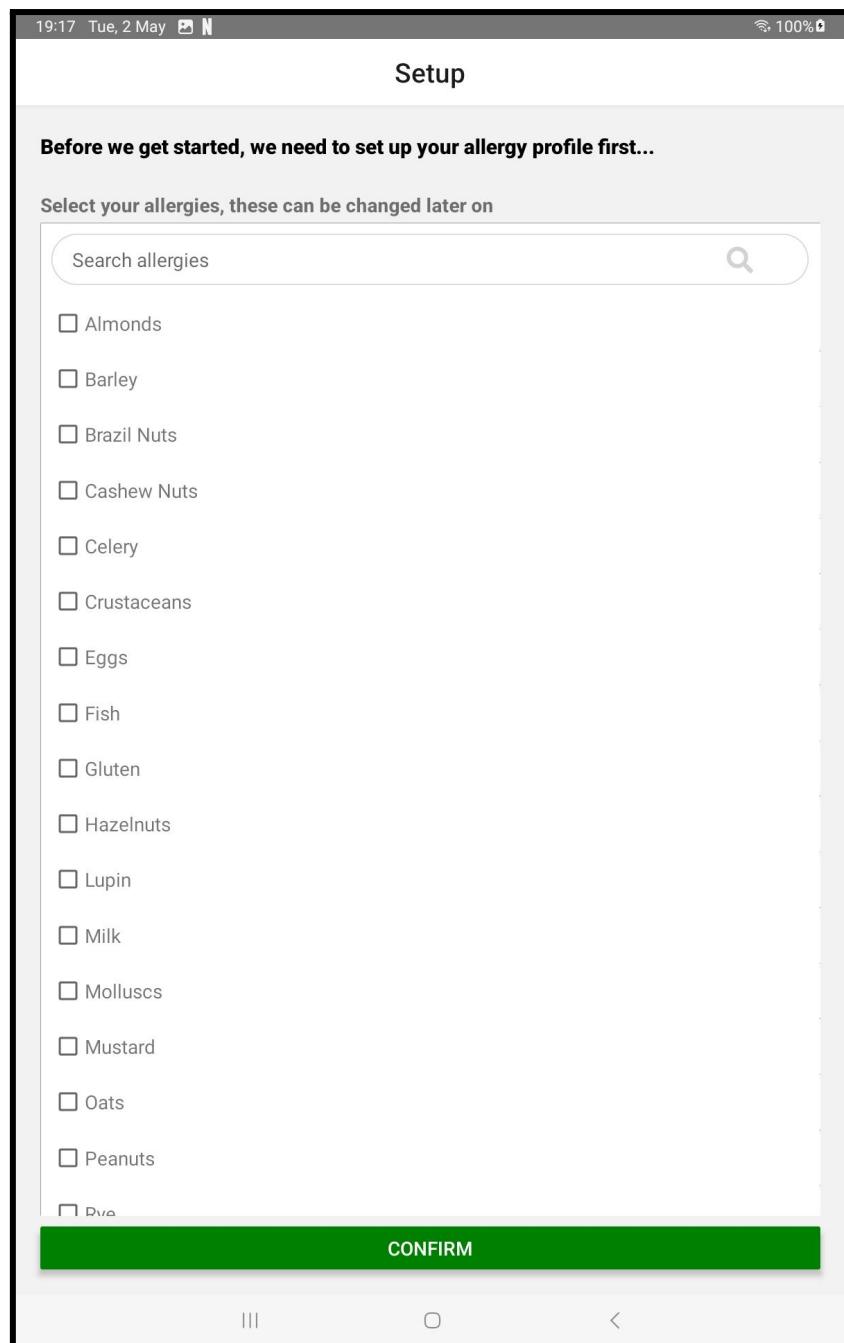


Figure 7.

Press confirm once you are happy with your selection.

You are almost ready to begin using MyAllergyAssistant, please carefully read the disclaimer and FAQ for your safety and information.

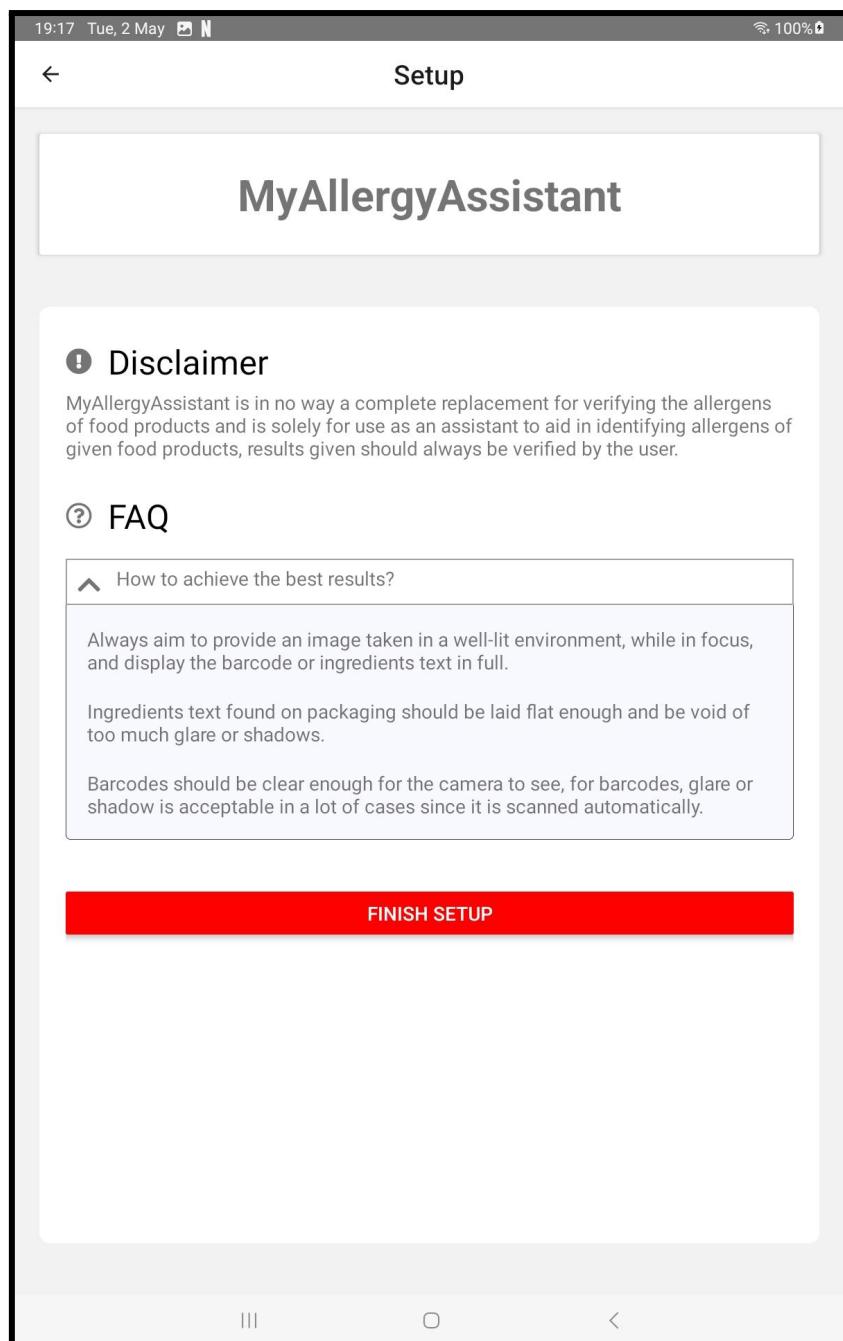


Figure 8.

Once you are ready, press 'FINISH SETUP'. Once you have successfully set up and registered your account, you will be brought to the home page.

2.2.3. Logging in

There are two options based on the account(s) you have created.

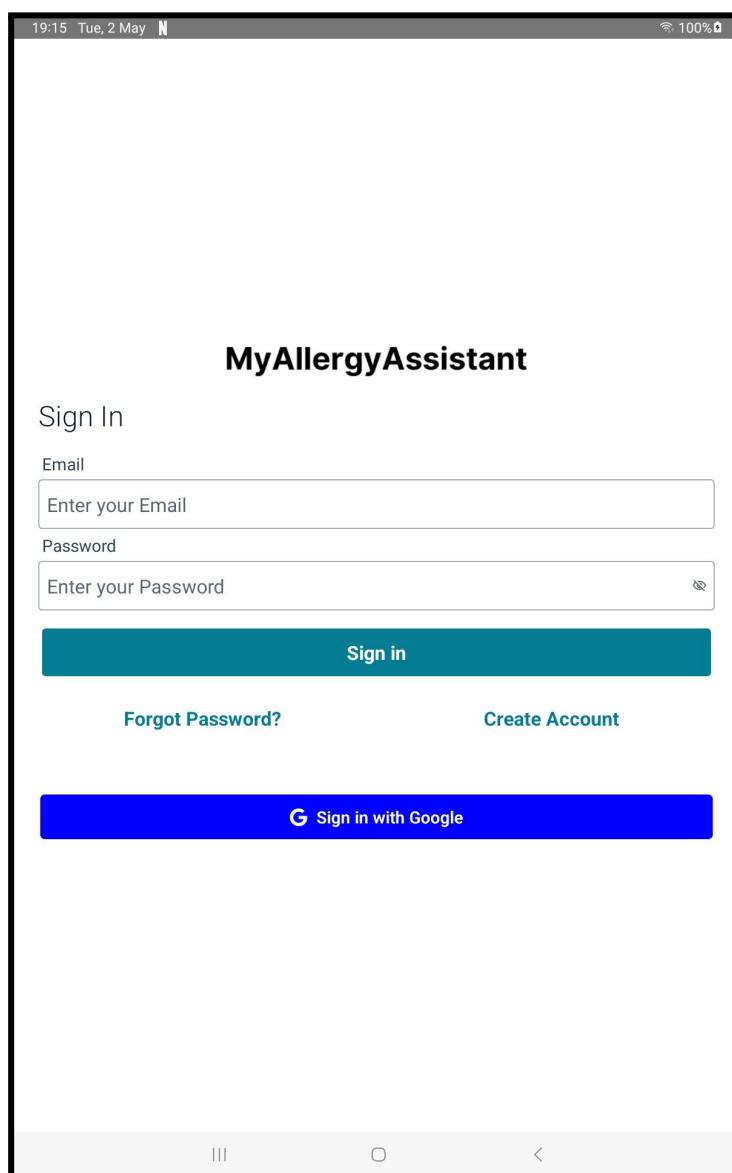
a. Regular Sign-in

Fill in your email address and password, ensure they are the same as at registration. Once you have signed in, you should be redirected to the home screen provided you have finished setting up your account. Otherwise, you will be redirected to the setup screen. If you cannot remember your password, instructions to reset your password can be found below.

b. Google Sign-in

To sign in with Google, press the ‘Sign in with Google’ button, you will be redirected to a page within the app to Google account sign-in. Once you are finished signing in with Google, provided you have finished setting up your account earlier, you should be redirected to the home page. Otherwise, you should be redirected to the setup screen if you have not completed your setup. If you cannot remember your password, you can follow the [instructions](#) provided by Google to reset your password.

Figure 9.



2.2.4. Resetting your Password

If you have a Google account, you can skip the other steps below, follow the [instructions](#) provided by Google to reset your password instead.

If your account was created through Regular Sign-in, first, go to the Sign In form, below the ‘Sign In’ button you should see a ‘Forgot Password?’ button. Press the button, you should be brought to another form ‘Reset Password’, enter your email address and press ‘Send Code’.

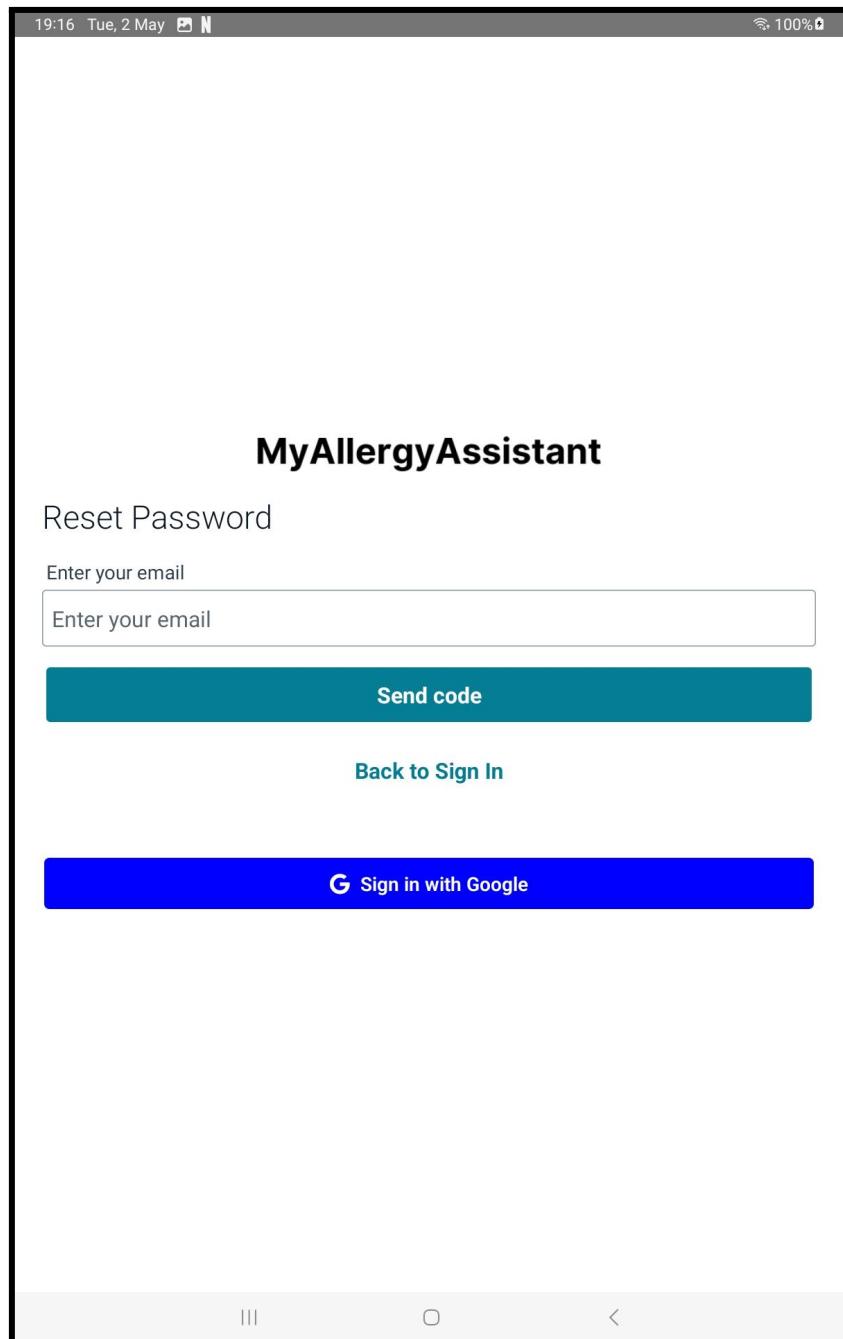


Figure 10.

You will then receive an email from no-reply@verificationemail.com (if not press ‘Resend Code’), containing a 6 digit code. You will be shown a form to reset your password, as shown below.

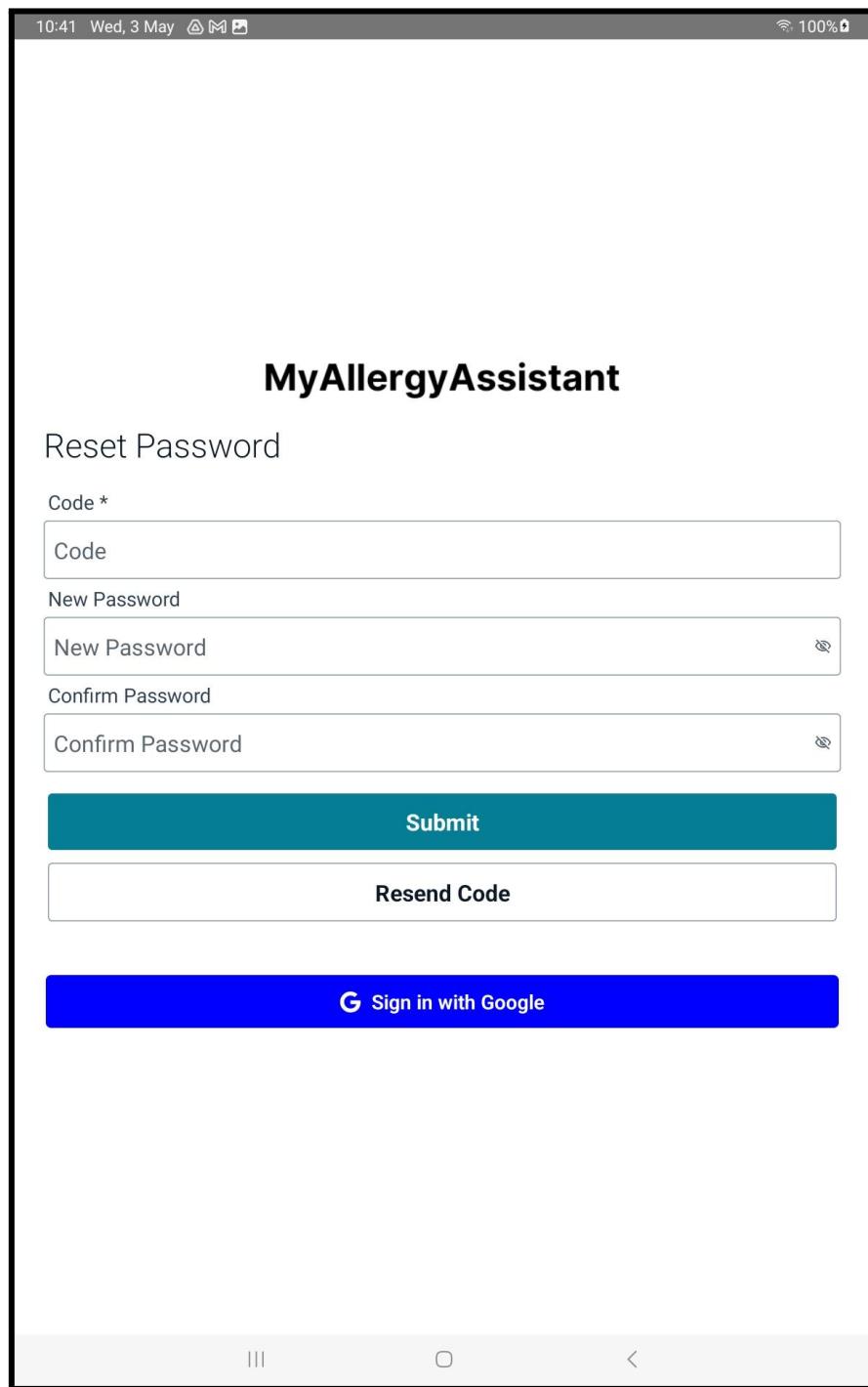


Figure 11.

Once you have received the code, enter it into the ‘Code’ field, and enter your new password to be filled in twice. You should be redirected to the Sign In form once you have finished where you can log in with your new password.

2.2.5. Logging out

Once you are logged in, you can log out at any time through the profile screen. Once you are in the profile screen, press the 'Logout' button. Once pressed you will be returned to the SignIn screen.



Figure 12.

2.2.6. Deleting your account

Once you are logged in, you are allowed to delete your account at any time, this can be done by navigating to the Profile screen and pressing the 'Delete Account' button in the list of profile options. Beware that once your account is deleted, you can never get your account data back, you can however use the same email to create it again.

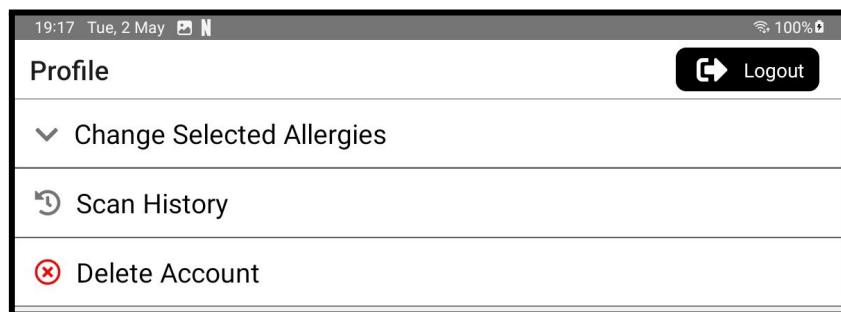


Figure 13.

Once you have pressed the button, a pop-up will appear to make sure you are ok with deleting your account. If you wish to delete the account, press 'Yes - Delete Account', otherwise press 'Cancel'. If you have deleted your account, you will be brought to the SignIn page.

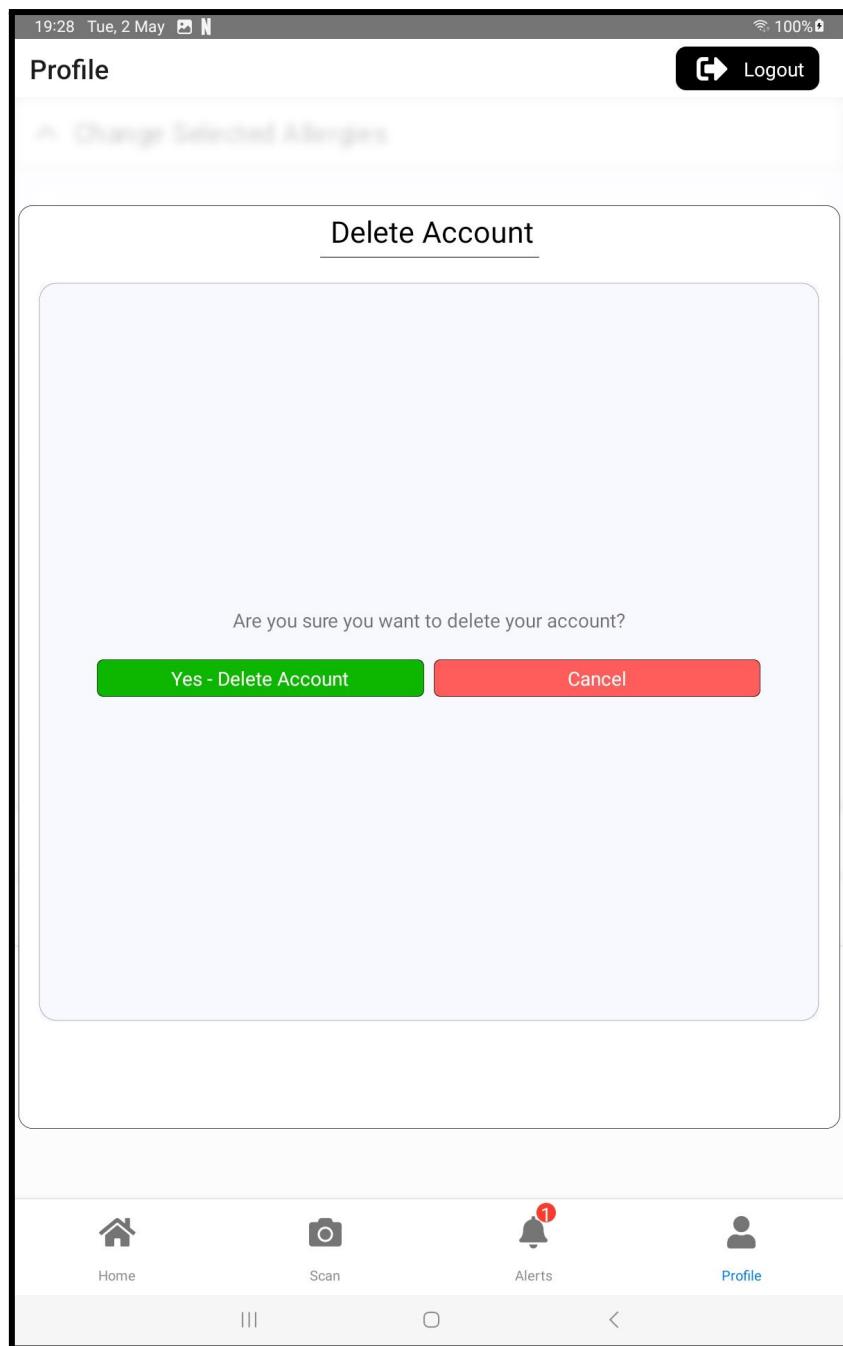


Figure 14.

2.2.7. Updating your account allergens

Once you are signed in to your account, you can change the allergens linked to your account at any time. This can be done by navigating to Profile, and by opening 'Change Selected Allergies' if not open already. There you can search and select/deselect any allergies as you wish, once you are happy with your changes you can then press 'CONFIRM'. A message will pop-up to confirm your changes have been saved successfully.

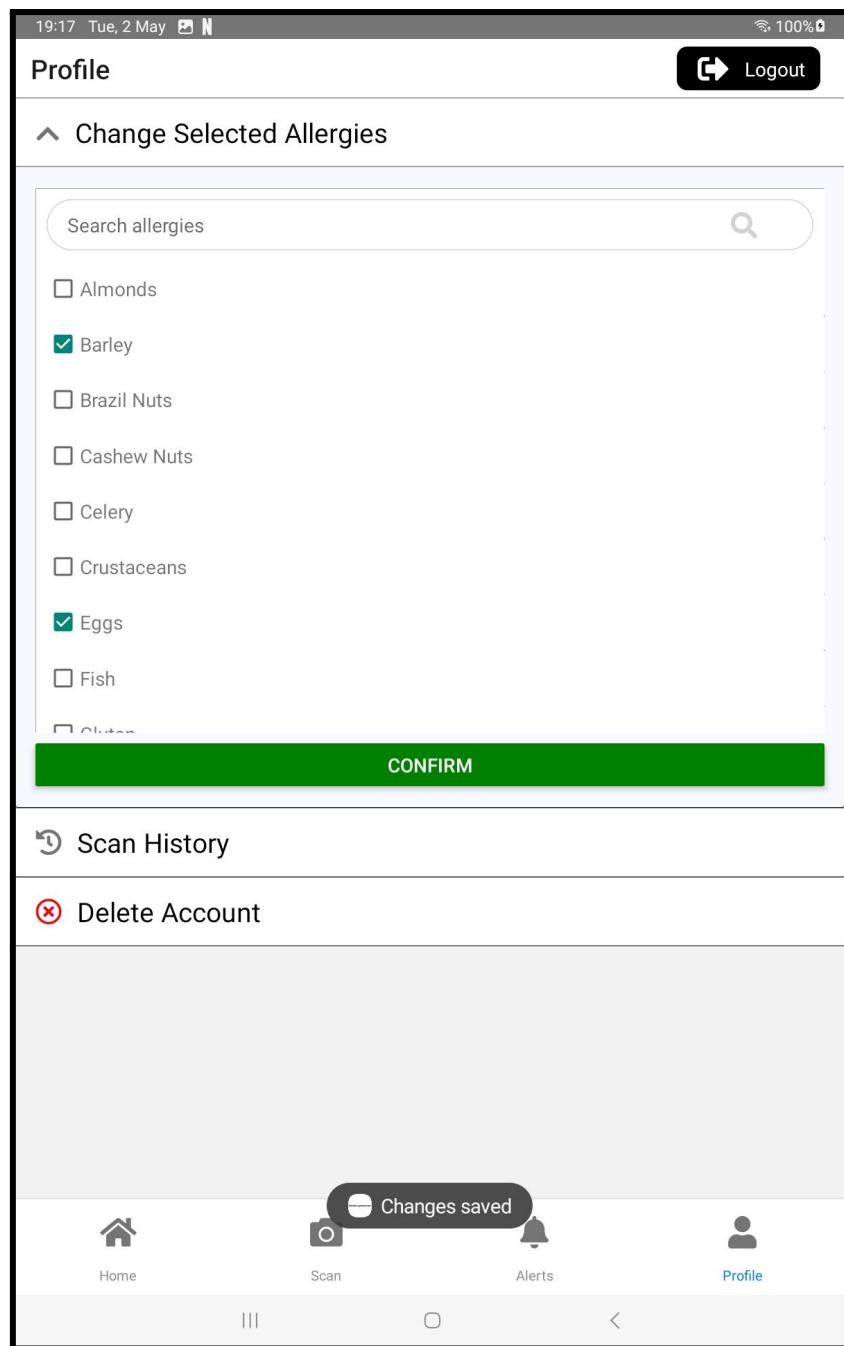


Figure 15.

2.3. Scanning Products

There are multiple options for scanning products from around the app against your allergy profile:

- **Scan:** Scanning Barcode, Scanning Ingredients, Scanning Both
- **Home:** Searching for a Product
- **Alerts:** Scanning Reported Products
- **Profile:** Scan History

The steps for each method will be explained in detail below.

Note: When scanning ingredients or barcodes, we recommend that you scan within a well-lit environment, allowing for little glare or shadows to appear on the product to ensure they do not negatively affect your result.

2.3.1. Help with Scanning Products

Instructions are provided in the app which can be accessed from the scanner, this can be done by pressing the help button in the top right corner.



Figure 16.

When you press the 'Help' button, you will be brought to a screen containing instructions as seen below.

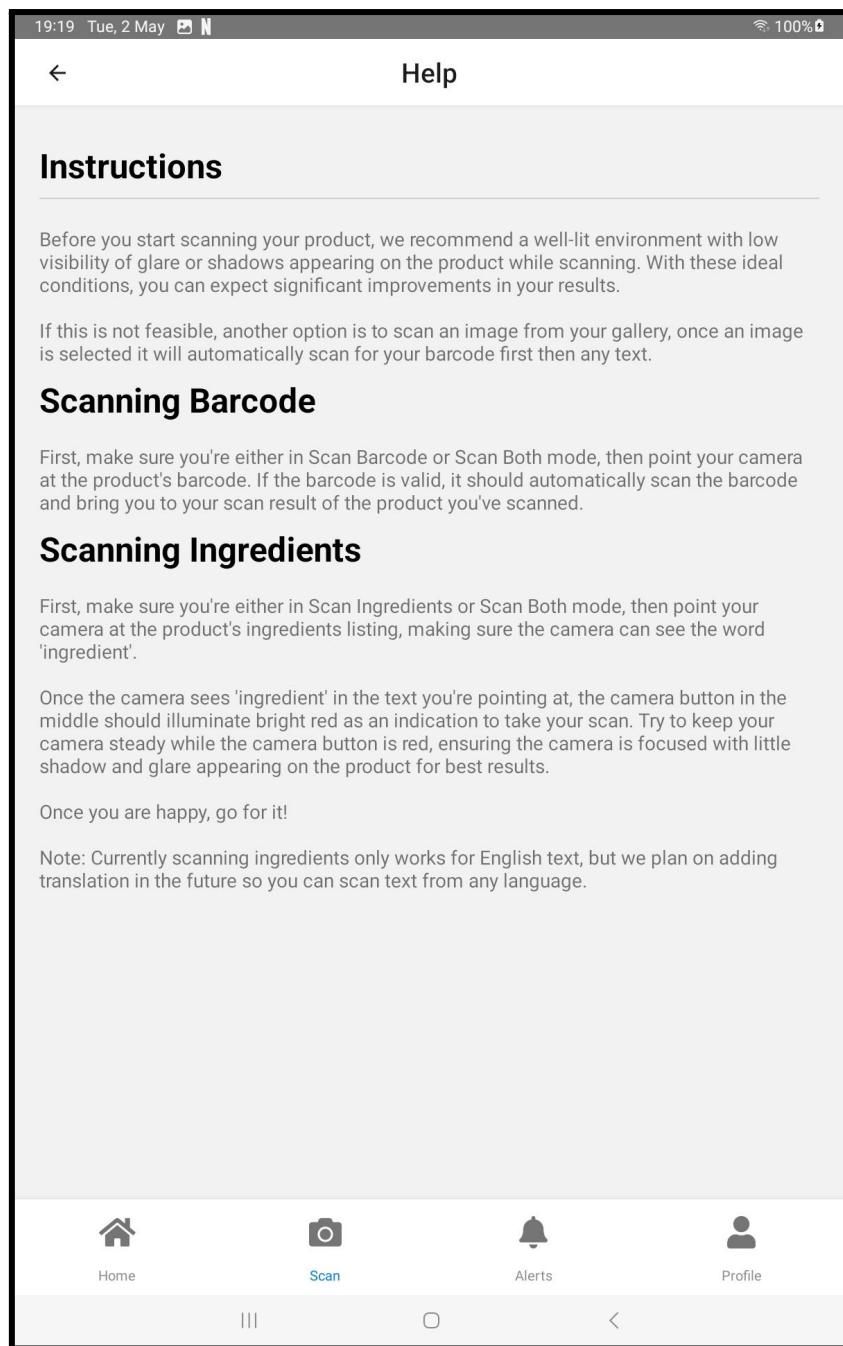


Figure 17.

2.3.2. Scanning an Image from Gallery / Camera Roll

If you don't want to scan the product barcode/ingredients with your camera, you can select an image from your camera roll to scan, by pressing the button in the bottom left of the Scan screen, which can be seen below.



Figure 18.

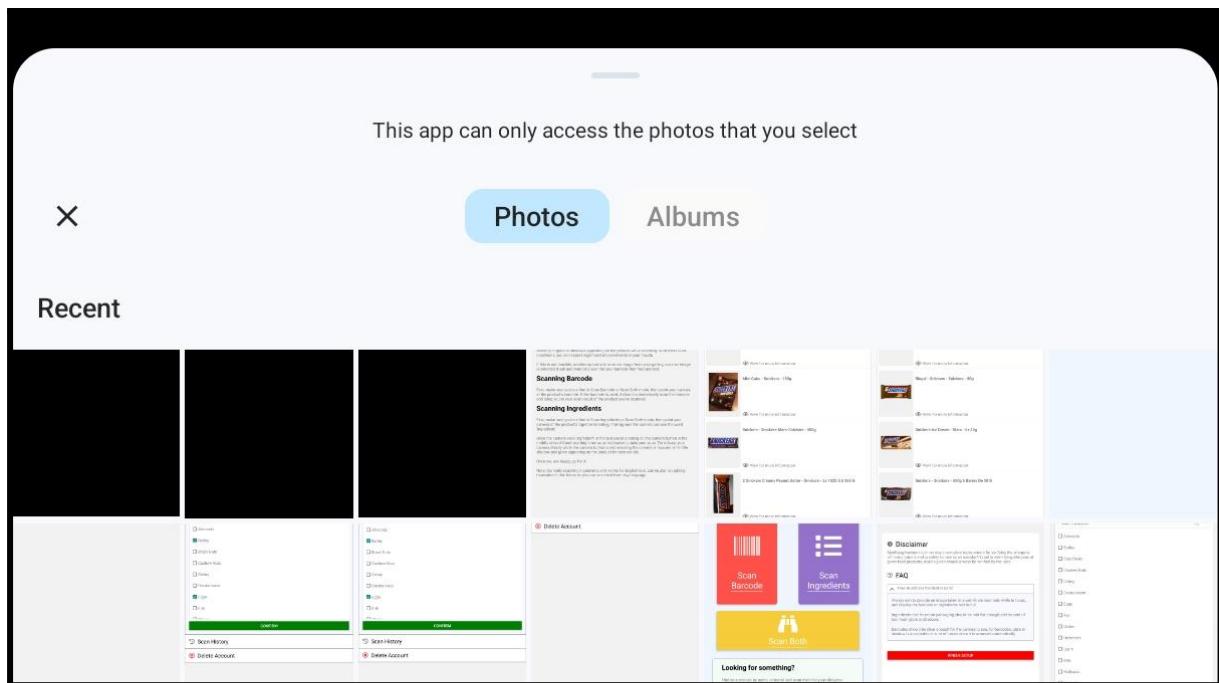


Figure 19.

The scanner will detect automatically whether there are ingredients displayed on the image or barcode(s).

2.3.3. Selecting Scan Mode

To scan the way you wish, you will need to select a scan mode from the three options available. These are **Scan Barcode**, **Scan Ingredients**, and **Scan Both** mode, as indicated by the buttons on the home screen.

'Scan Both' allows the camera to scan for barcodes and ingredients at the same time. Instructions on how to use them are detailed later below.

Note: Regardless of which mode is selected, images selected from gallery/camera roll automatically scan barcode if any is found, otherwise it will scan any text.

You can start scanning in two ways:

a. From Home Screen

Select one of the three options as shown below:

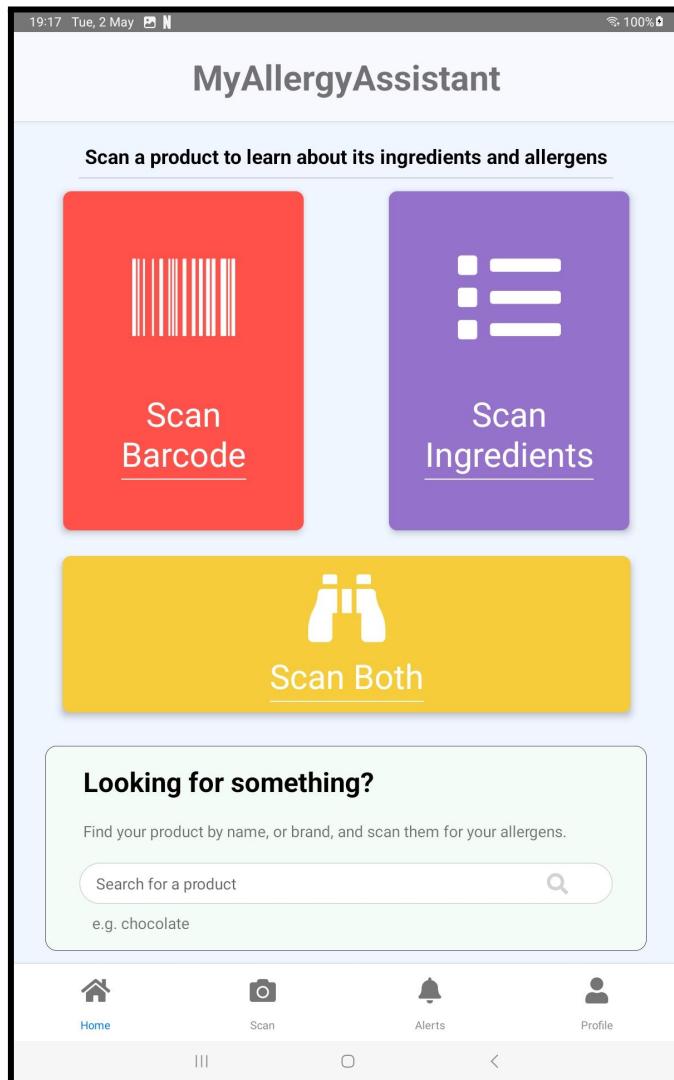


Figure 20.

b. From Scan Screen

The scan mode button corresponds to the buttons shown in the home screen. Once you press it, it will change to the next mode. A pop-up will show you which mode you are currently using. By default, the scanner uses **Scan Both**.

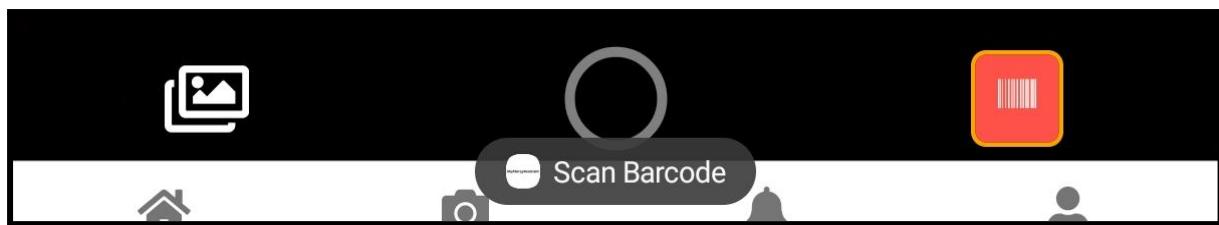


Figure 21.

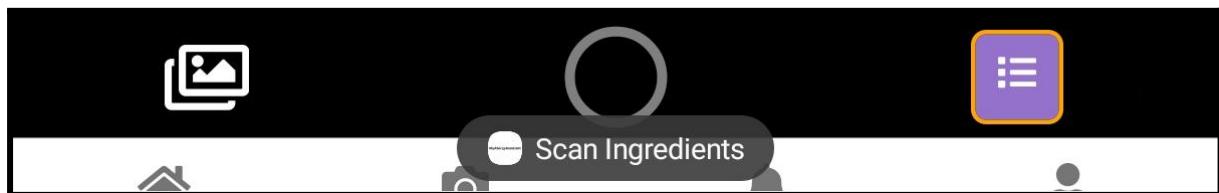


Figure 22.

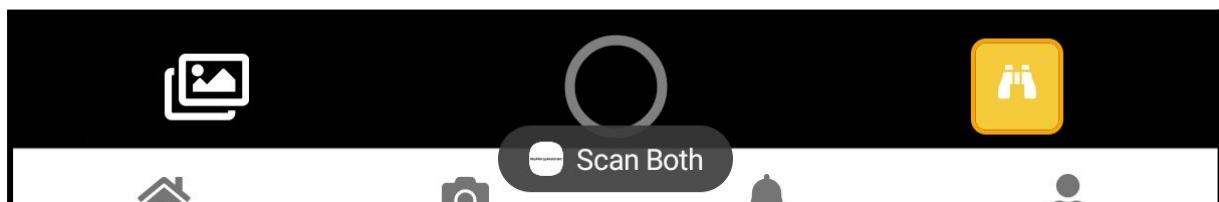


Figure 23.

2.3.4. Scanning Barcode

Following the recommended environment conditions detailed above in 2.3. for best results, first, select **Scan Barcode**. Once the pop-up appears, you are ready to scan a barcode with the product. Point your camera at the barcode, or select an image from your gallery containing a barcode. The app will pick the barcode it sees first and automatically scan the product against your allergy profile. While scanning, a loading screen will be shown to the user, as shown below.

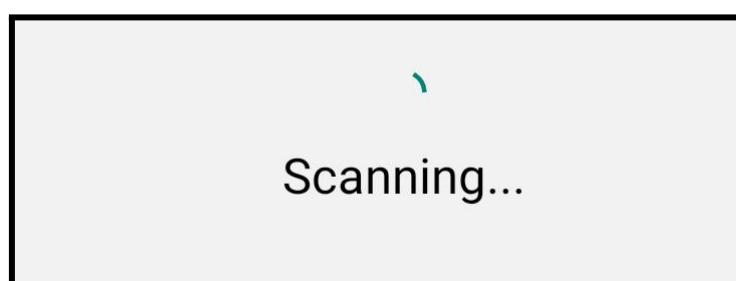


Figure 24.

If the product exists in the OpenFoodFacts database, you will be brought to the product page, displaying all the information about that product. An example of which can be seen below.

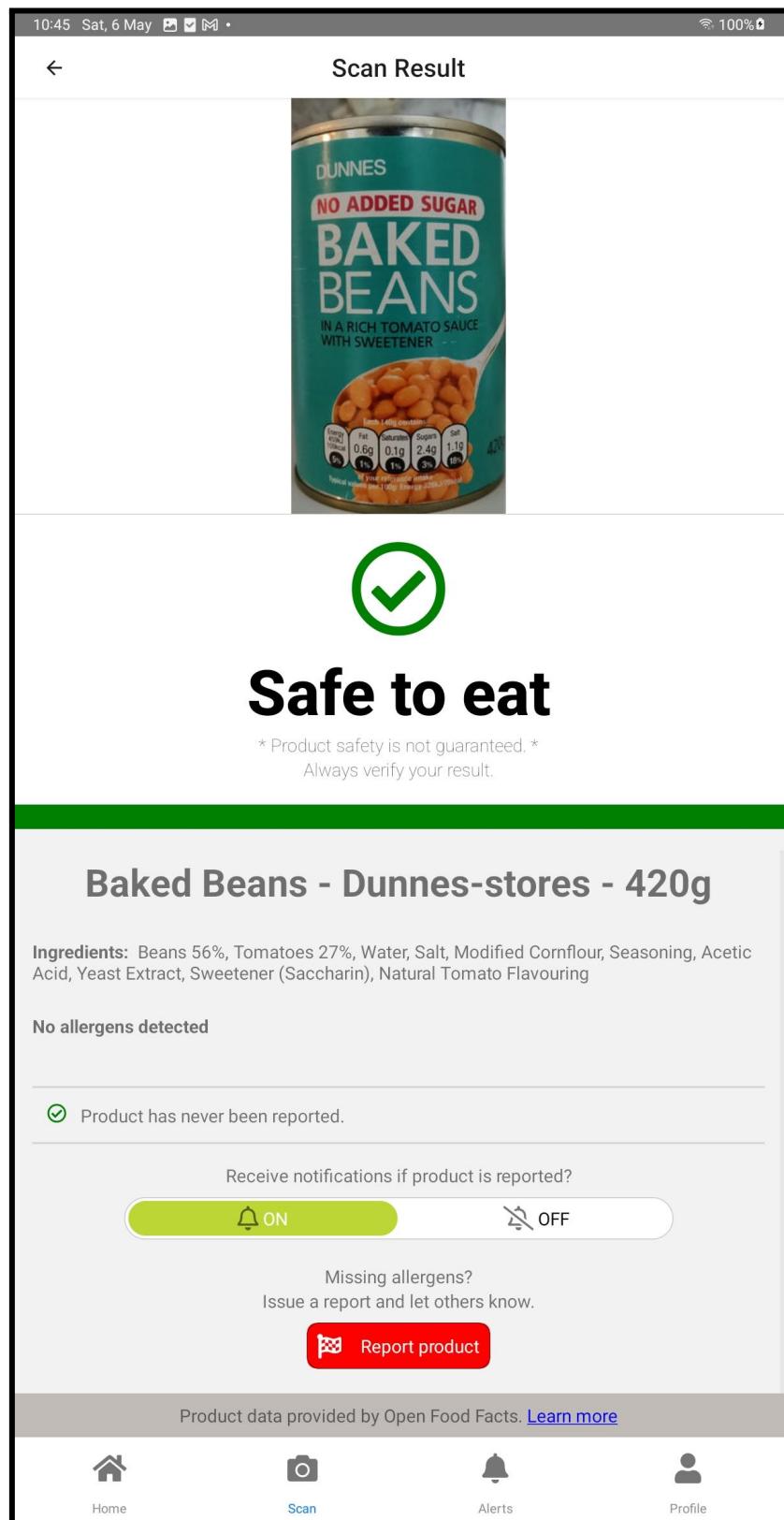


Figure 25.

Otherwise, if the product does not exist in the database, an error message is displayed, as shown below.

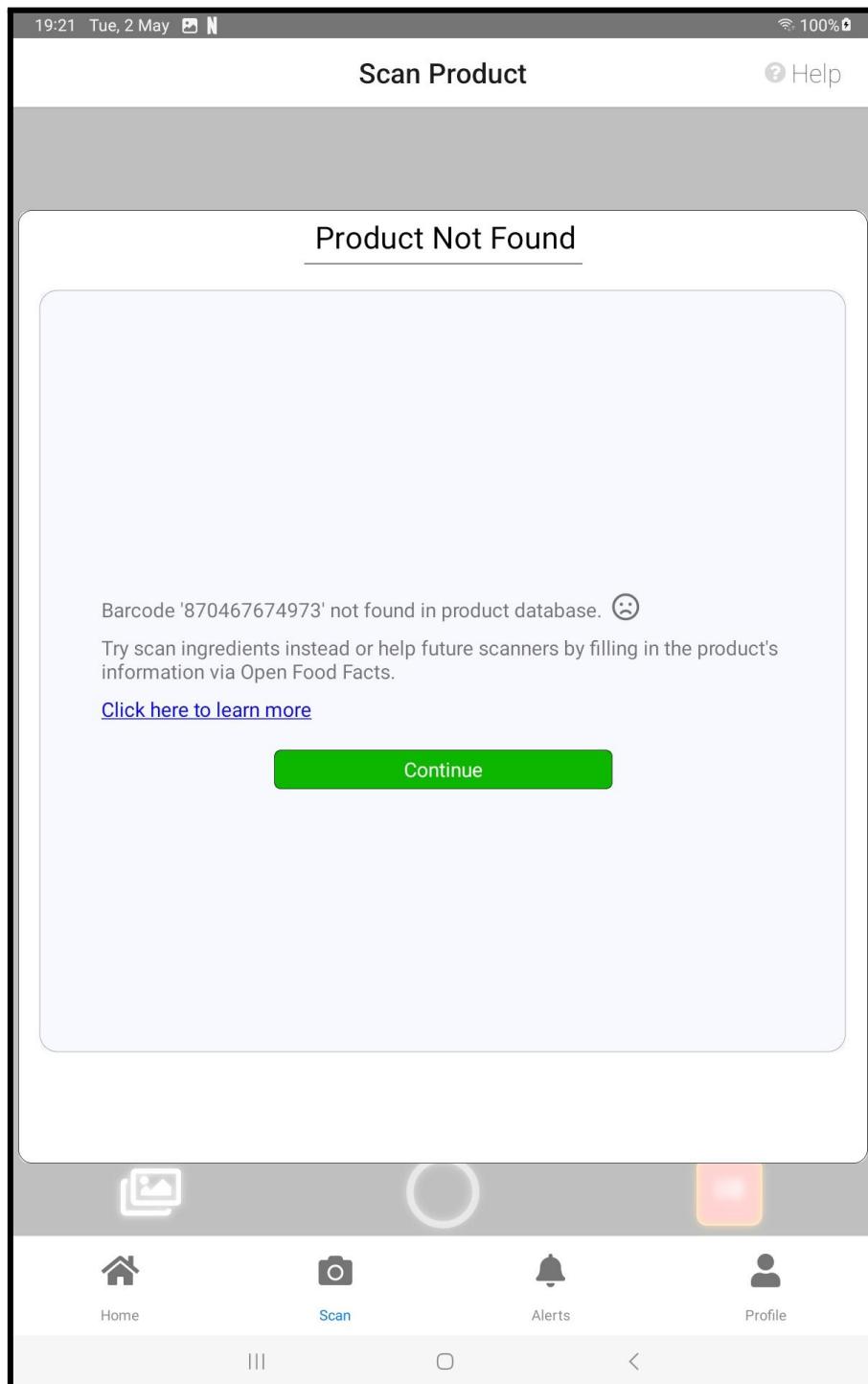


Figure 26.

2.3.5. Scanning Ingredients

Following the recommended environment conditions detailed above in 2.3. for best results, first, select **Scan Ingredients**. Once the pop-up appears, you are ready to scan the ingredients of a product. There are two options, you could select an image, which will scan

all the text when you're ready, otherwise you can point your camera at a product with you. If you have chosen to use your camera, ensure that the camera can read the word 'ingredient'. When the word 'ingredient' is detected, it will illuminate the camera button bright red, indicating that you can capture an image.



Figure 27.

Once you have selected your preferred option, you should see a pop-up allowing you to crop the image (recommended for better results), otherwise you can scan the image if you wish to.

2.3.6. Scanning Both

This option allows you to use both options listed above at the same time, the scanner will detect either. This is the default option.

2.4. Search for a Product

You can search for any product you like by name, or brand, by typing in the search box at the bottom of the home screen.

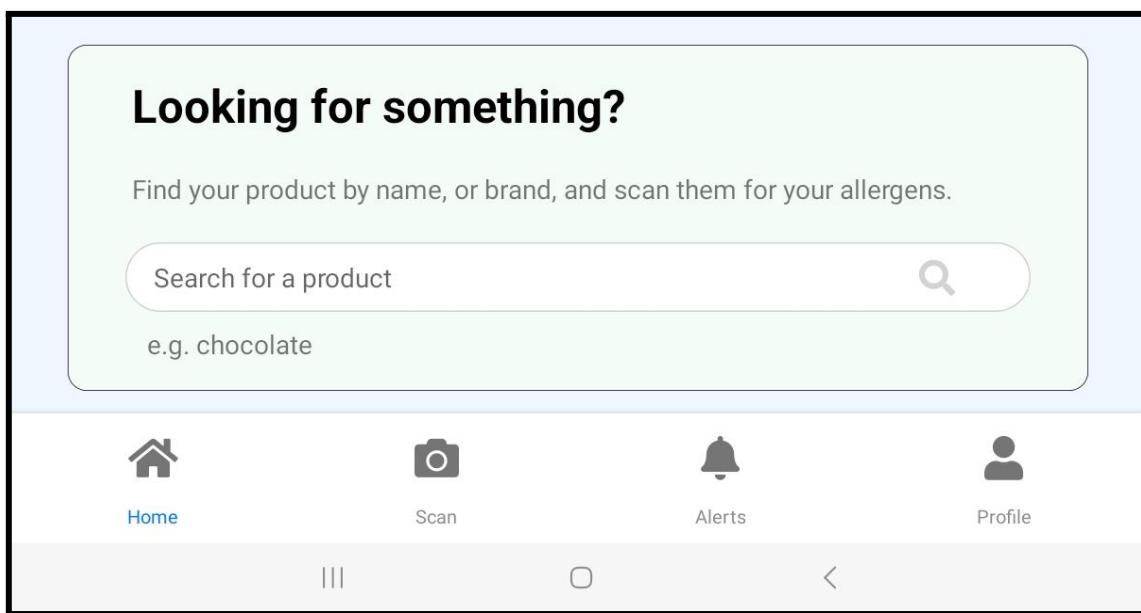


Figure 28.

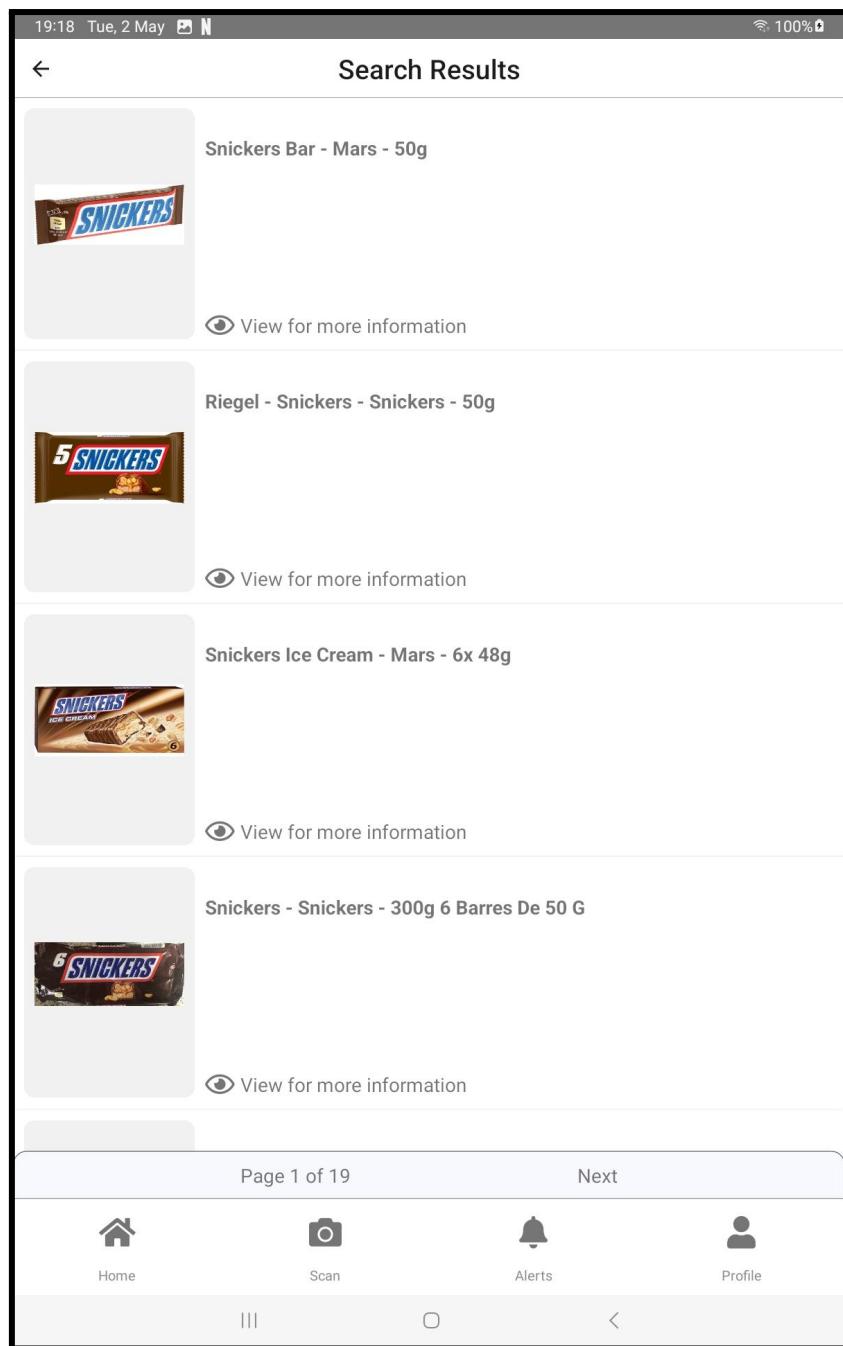


Figure 29.

Once you have searched for a particular string, you will be brought to a search results screen, where you can scroll through various results till you are satisfied. Note: In the below example, I searched for 'snickers'.

You can press the “Next” button at the bottom of the screen, to go to the next page of results. Similarly, you can press the ‘Previous’ button to go back to the previous page of results.

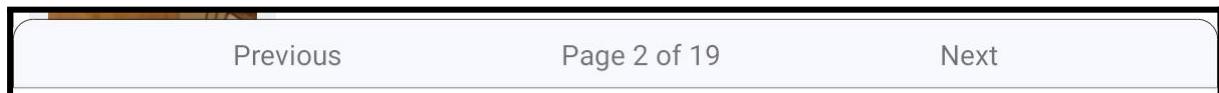


Figure 30.

2.5. Viewing your Scan History

You can view all of your previously scanned products by pressing the ‘Scan History’ button in the profile screen.



Figure 31.

If you have never scanned any products, you will be shown ‘No scanned products’, as shown in the image below.

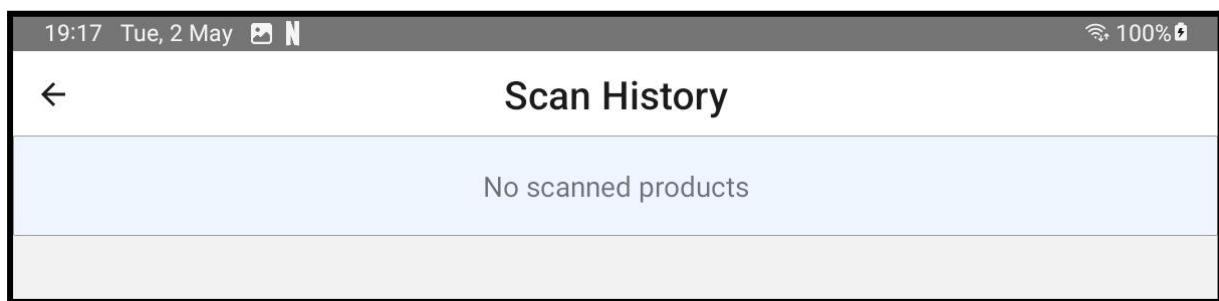


Figure 32.

If you have any previously scanned products, they will be shown in order of most recently scanned. You can press any product on this screen, which will bring you to that product page for that product.

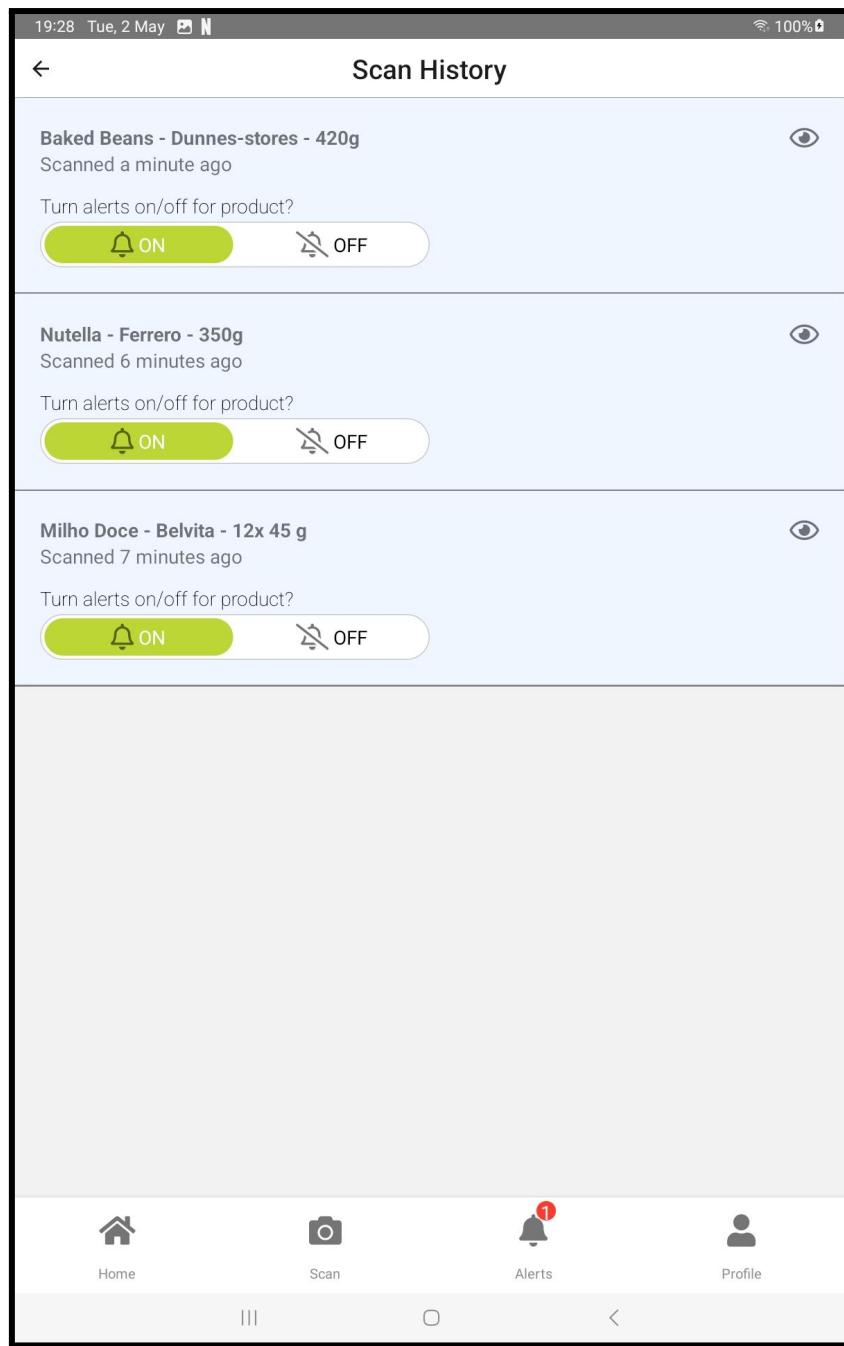


Figure 33.

You can also toggle alerts on or off for each product in your scan history by pressing either ON / OFF, more information on the significance of alerts will be found below.

2.6. Barcode Scan Results

2.6.1. Interpreting your Scan Result

When you get to the product page for a given product, first, you will see the image of the product you have selected, under it, it will analyse and determine if the product is safe to eat or not (for different types of safety indicators see below). It may not be safe to eat if it has been reported previously or if the product has no existing information.



Figure 34.

The analysis will complete once it has translated the text and checks against your allergy profile.

Below are the types of safety indicators you can expect:

1. If any of your user allergens are detected in the products data, 'Not safe to eat' will be displayed.



Figure 35.

2. If none of your user allergens are detected in the products data, but the product has been reported, then the following warning is displayed.



Figure 36.

3. If the product's ingredients are unavailable, then the following warning will be displayed.



Figure 37.

The user also has the option in this case to add product data via OpenFoodFacts (OFF) to inform future users, by pressing the ‘Click here’ text, they will be brought to edit that product’s data on OFF’s website.

Ingredients not available.
Allergen information unavailable
[Click here](#) to update the product information via Open Food Facts to inform future scanners.

Figure 38.

4. If none of your allergens were found, it is displayed to the user that the product seems safe to eat, with a disclaimer underneath.



Figure 39.

Beneath the safety indicator, you will find information about a product, such as the product name, ingredients, allergens, and traces (if any).

Note: Product data is provided by [Open Food Facts](#) API, as noted in the footer of the product page. The user will be redirected to OFF’s website by pressing ‘Learn more’.



Figure 40.

If any of your allergens were found, a table will display any of your allergens identified in the product's information for your convenience.

User allergens detected	Listed as
Hazelnuts	nuts
Milk	milk
Barley	barley, (barley, barley), gluten
Cashew nuts	nuts
Gluten	wheat, barley, (barley, barley), gluten
Wheat	wheat, gluten

Figure 41.

Below is an example image of the product page for a French cereal called Chocapic.

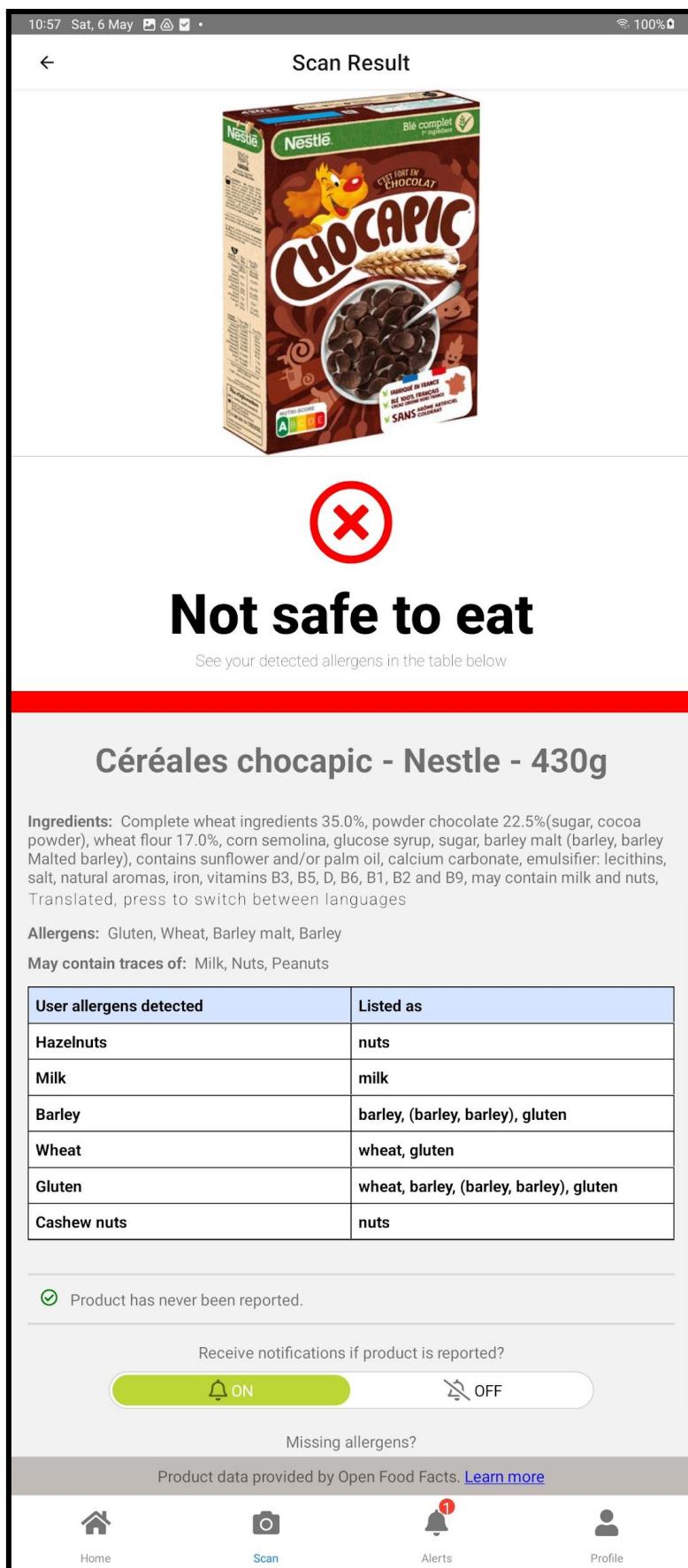


Figure 42.

2.6.2. Translating Ingredients

You may find that some information has been translated to English, you are able to switch back to the original language by pressing the text. **Note:** text is automatically translated to English initially, but users have the option to view the original text.

Ingredients: Complete wheat ingredients 35.0%, powder chocolate 22.5%(sugar, cocoa powder), wheat flour 17.0%, corn semolina, glucose syrup, sugar, barley malt (barley, barley Malted barley), contains sunflower and/or palm oil, calcium carbonate, emulsifier: lecithins, salt, natural aromas, iron, vitamins B3, B5, D, B6, B1, B2 and B9, may contain milk and nuts, Translated, press to switch between languages

Ingredients: Ingrédients blé complet 35,0%, chocolat en poudre 22,5% (sucre, cacao en poudre), farine de blé 17,0%, semoule de maïs, sirop de glucose, sucre, extrait de malt d'orge (orge, orge malté), contient de l'huile de tournesol et/ou de palme, carbonate de calcium, émulsifiant : lécithines, sel, arômes naturels, fer, vitamines B3, B5, D, B6, B1, B2 et B9, Peut contenir du lait et des fruits à coque,
Translated, press to switch between languages

Figure 44.

This can be useful when purchasing products written in different languages that you don't understand while travelling abroad.

2.6.3. Viewing a Product's Reports

Below this information, you will potentially find existing or incoming reports containing various allergens from your report or other users which you can horizontally scroll through. If a product has no reports, the user is informed of that, as shown in the image below.

 Product has never been reported.

Figure 45.

If a product has been reported, the user is shown a warning message and can view the horizontal list of reports. Each report can be one of three colours: green, red or orange as seen below.

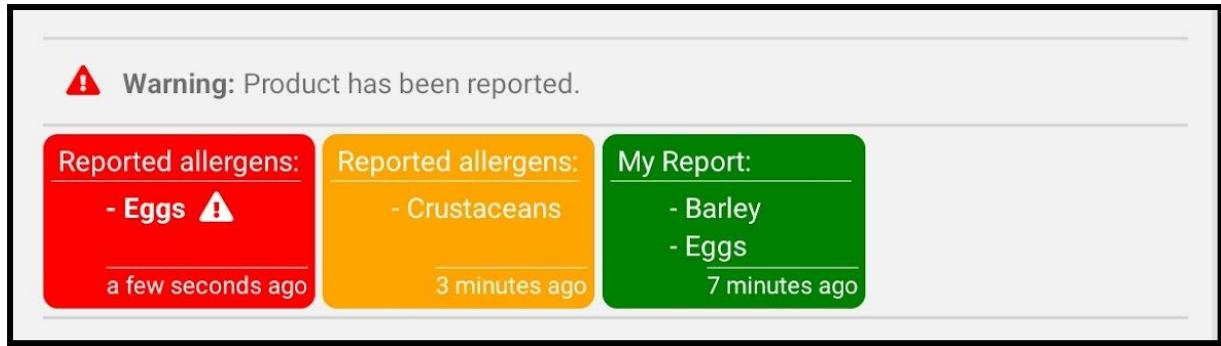


Figure 46.

- The green card indicates the report you've sent for this product.
- The orange card indicates suspected allergens that did not match any allergens from your profile.
- The red card indicates suspected allergens that did match any allergens from your profile. Your allergens are specifically highlighted by an icon beside the allergen besides any other allergens found in the report which are not yours (which do not include an icon).

The number of reports should give you an idea of how reliable a product is. With the red card, it does not necessarily mean it is not safe to eat, however based on the number of existing reports of your allergens, it can increase the likelihood it could be. In this case, you may wish to take more caution.

Alerts/notifications for future reports are turned on by default, however you can choose to turn them ON / OFF at any time from the scan result or **Scan History** for the product.

2.6.4. Reporting a Product

After consuming the product and suspecting the result may be incorrect, it would be good to let others know what allergen(s) you suspect to have caused your allergic reaction so they could take caution. This can be done by pressing the 'Report product' button at the bottom of that product's scan result screen.

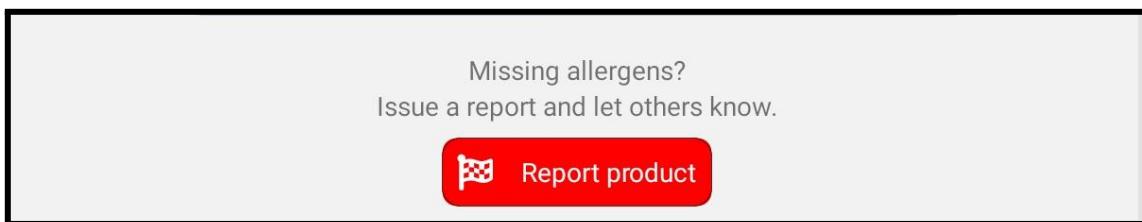


Figure 47.

You will then be shown the following popup to make the report.

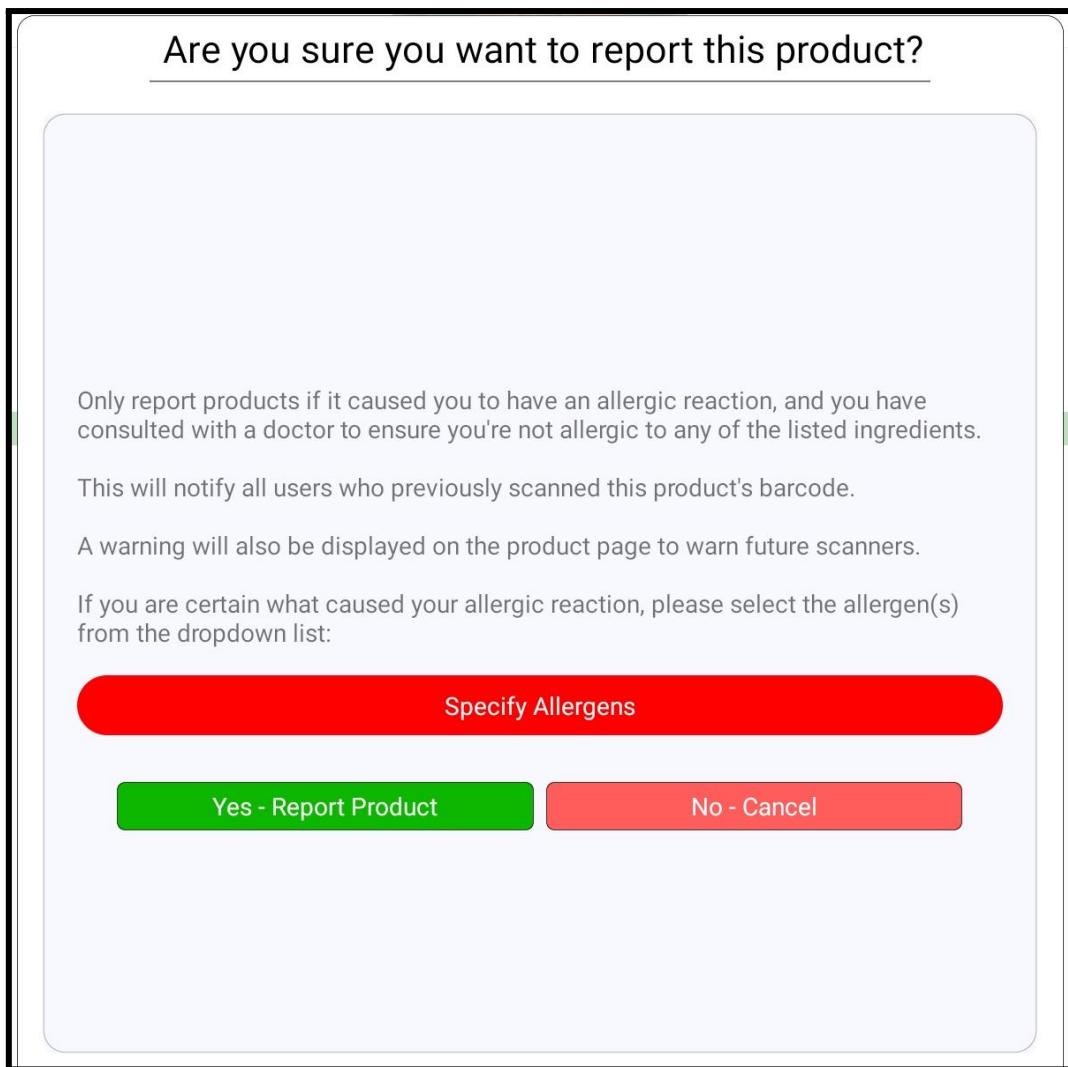


Figure 48.

Please read the disclaimer written before continuing with your report. If you are unsure which of your allergies caused your allergic reaction, then you can simply press the 'Yes - Report Product' button, which will take all of your account allergens as suspected allergens. Otherwise, if you are certain which allergen(s) caused your allergic reaction then you can press 'Specify Allergens' to select your suspected allergens.

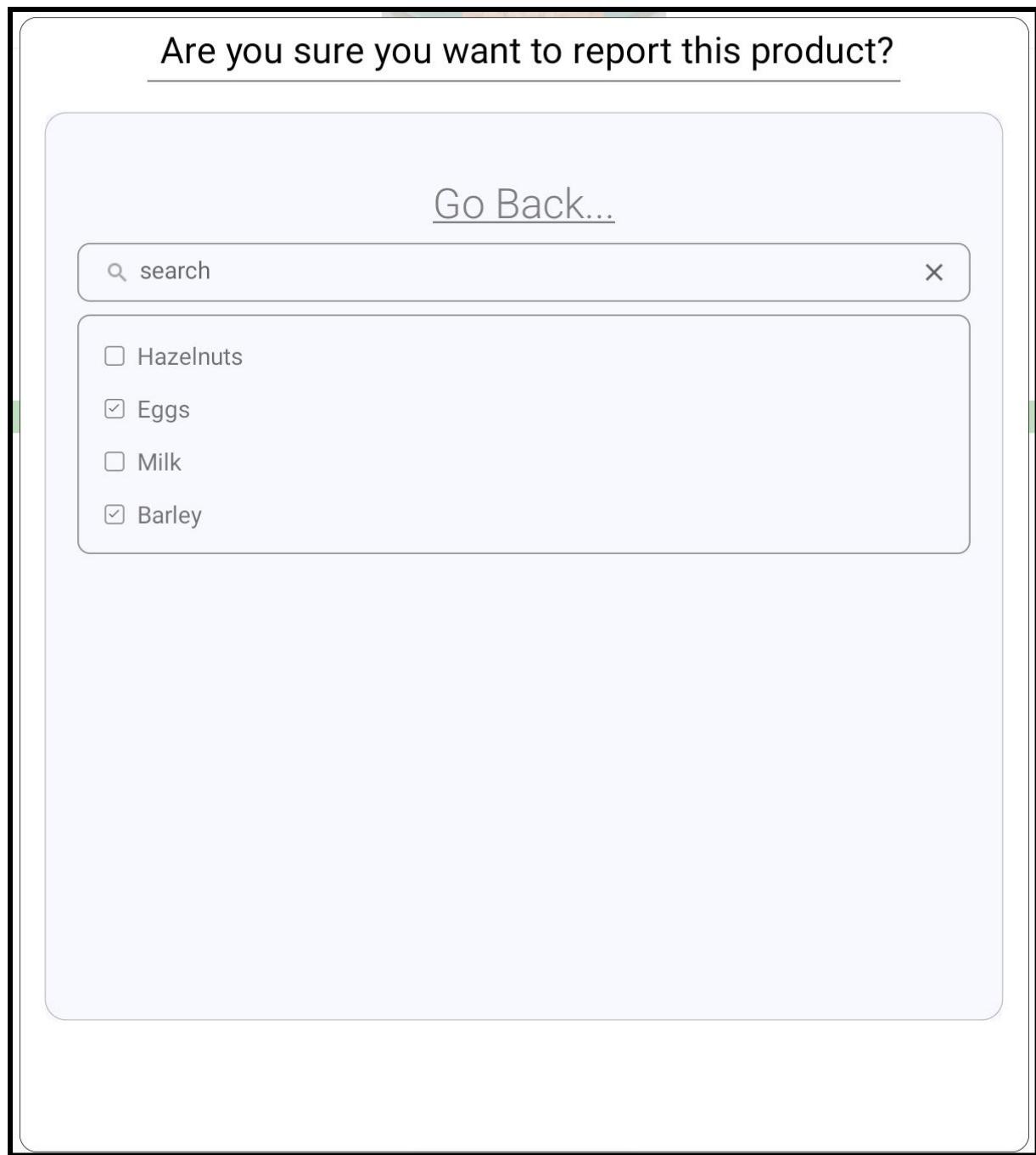


Figure 49.

Once pressed, you can select, from your list of allergens, the allergen(s) that you suspect to have caused your allergic reaction. Once you have confirmed your selection, you can press 'Go Back...'. You can then report the product by pressing 'Yes - Report Product'. Alternatively, you can press 'No - Cancel' to cancel your report and return to the product page.

After reporting a product, you can see your green card of your report in the result, as well as a confirmation of your report has been received in **Alerts**, if you had product notifications enabled.



Figure 50.

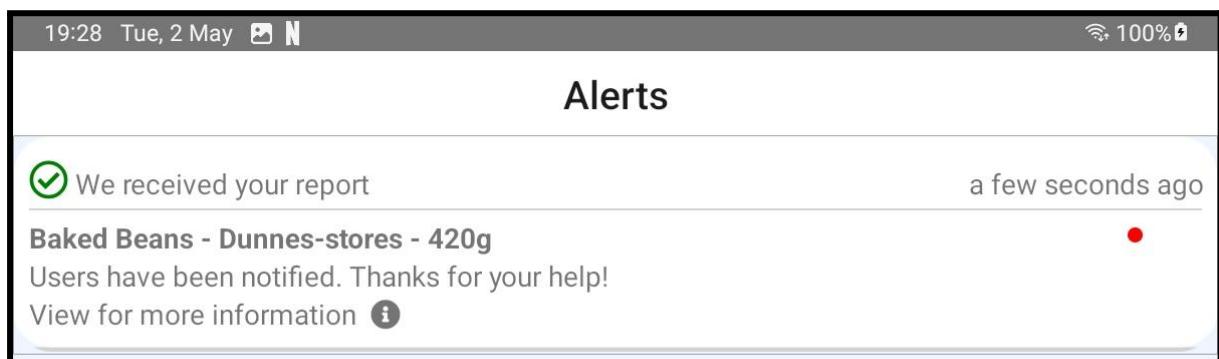


Figure 51.

2.6.5. Deleting your Report

If you are unhappy with your report, you can delete your report at any time by pressing the 'Delete Report' button at the bottom of the product's page. This will remove your report from the product page for all users.

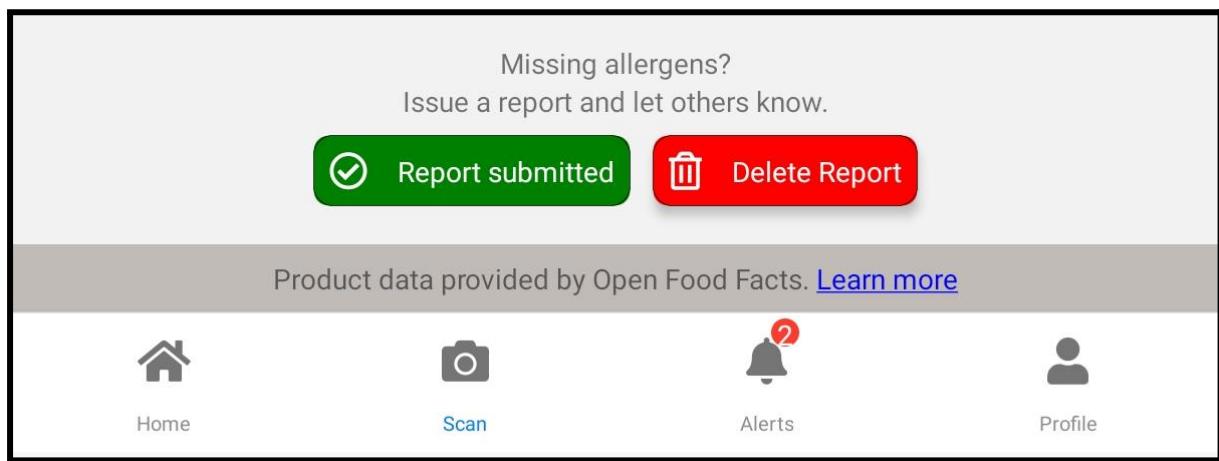


Figure 52.

2.7. Receiving an Alert

Initially after creating an account, you will not have received any alerts. So your alerts screen will look like this.

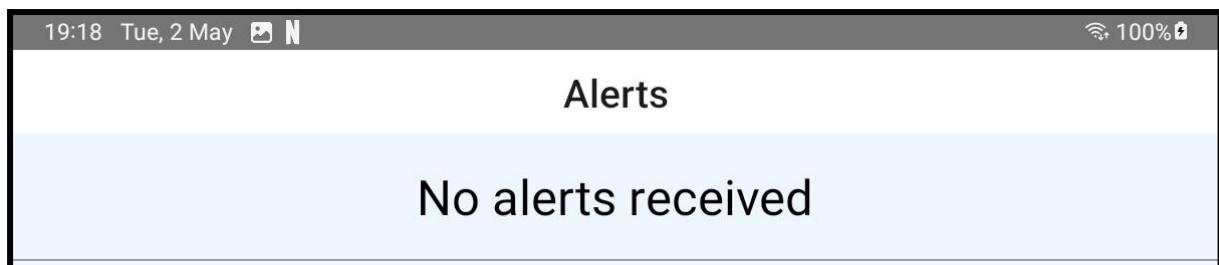


Figure 53.

When a product is reported that you have previously scanned, and have alerts enabled for, you will receive a notification from MyAllergyAssistant to your android device as shown in the image below.

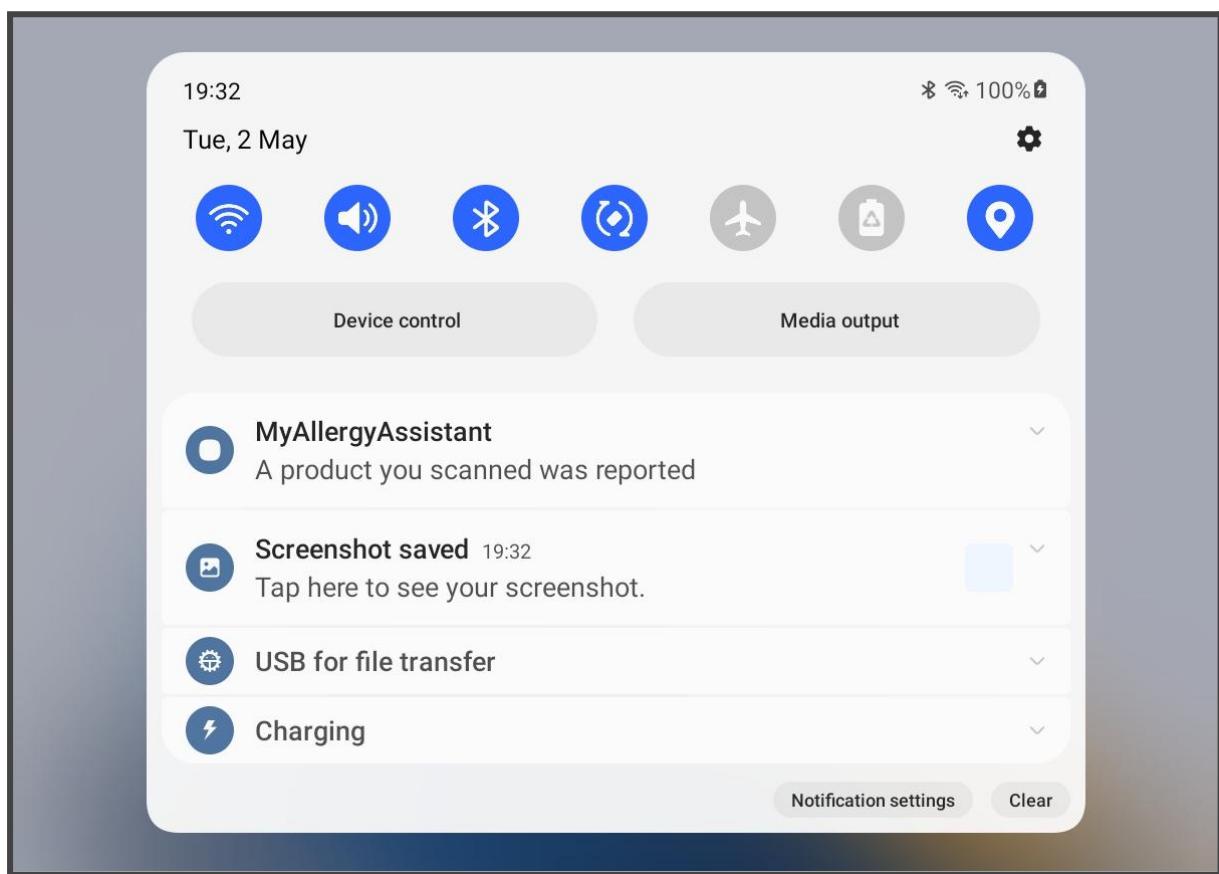


Figure 54.

You can press this notification to open the MyAllergyAssistant app.

Once the app is open, you will notice that the Alerts tab has a number in its badge which indicates the number of unopened alerts.

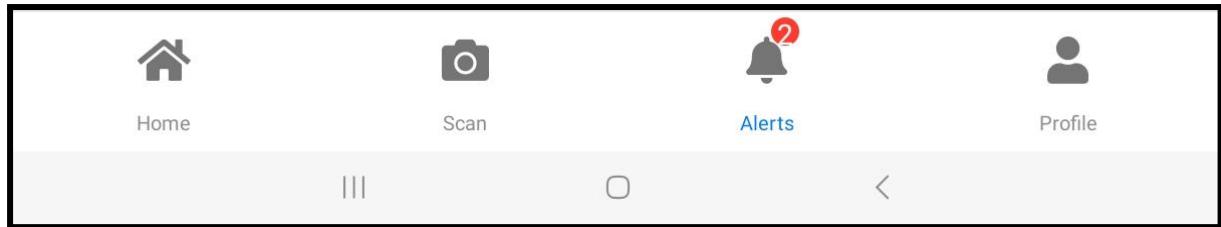


Figure 55.

Once you have navigated to the Alerts screen, you will see alerts about products that were recently reported, in order of most recent. There is also a red dot on the right of each alert indicating that it has not been opened yet.

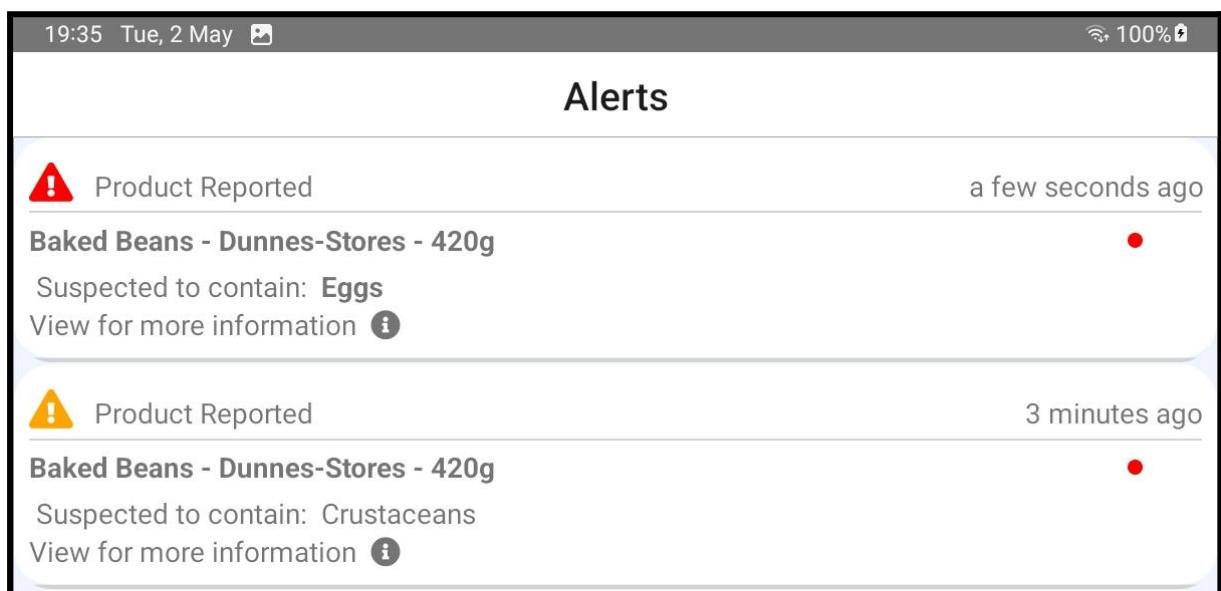


Figure 56.

You can press an alert to open it and be brought to the product page, where you will see all the reports for that product. Opening an alert will also mark the alert as 'seen', meaning that the red dot on the right hand side will disappear and the number of unseen reports in the alert tab badge will be decremented.

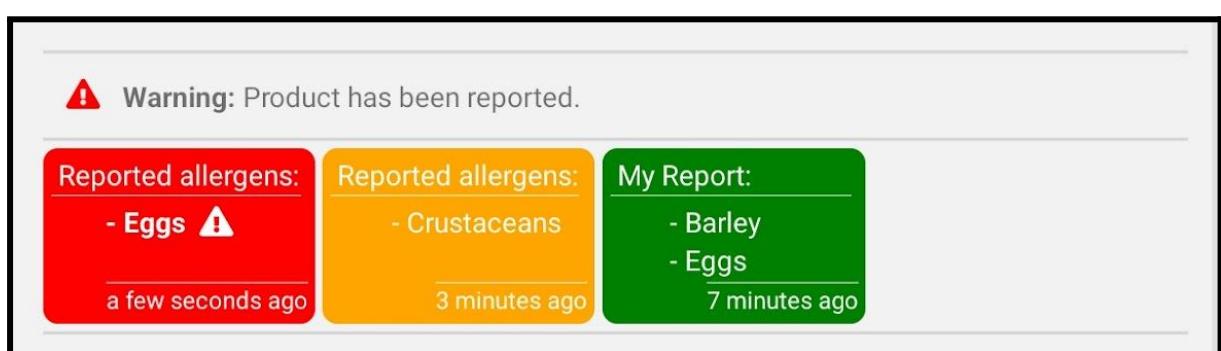


Figure 57.

These are the different types of alert indicators:

1. User submitted a report

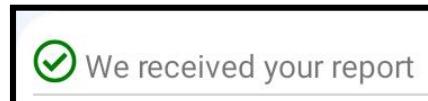


Figure 58.

2. A product you scanned was reported for containing one of your allergens.

The warning symbol will be red, and your suspected allergen(s) will be in bold.

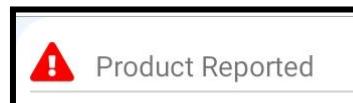


Figure 59.

3. A product you scanned was reported, but none of your allergens are suspected.

The warning symbol will be orange, and the suspected allergen(s) will not be in bold.

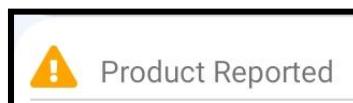


Figure 60.

2.8. Ingredients Scan Results

2.8.1. How to Scan Ingredients

First ensure you are in scan ingredients mode on the scan screen. Then aim your camera at the ingredients listed on the product packaging. The circular button at the bottom of the screen will turn red when it is ready to be pressed. The system searches in real-time for the keyword 'ingredient' and then the button will turn red.

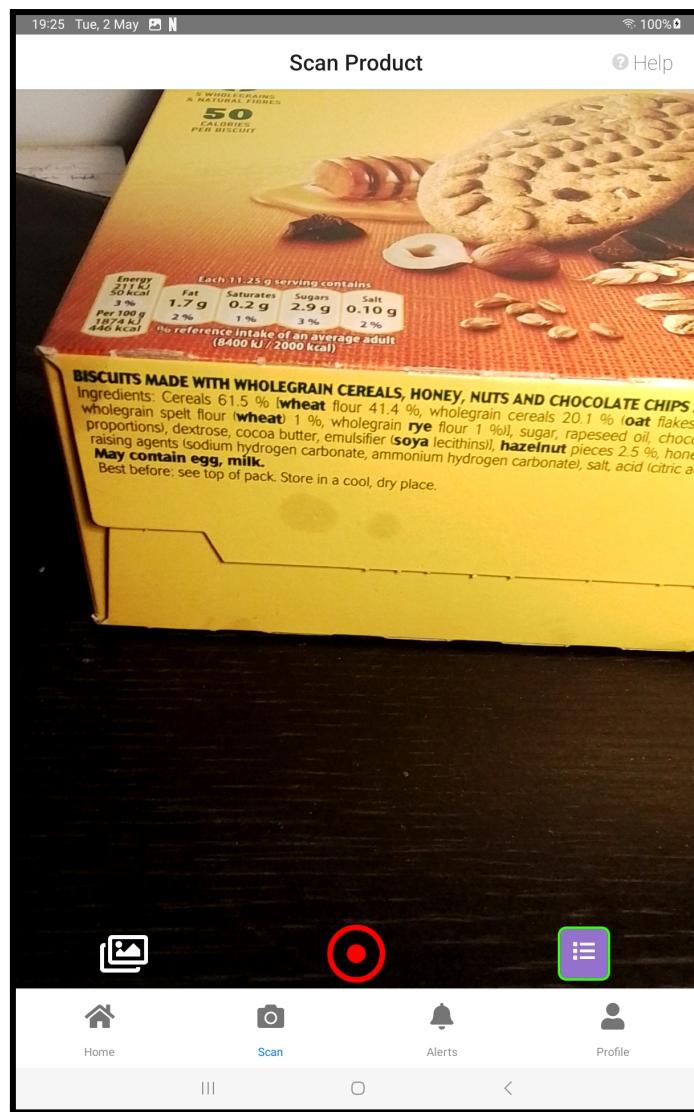


Figure 61.

Once you have pressed the red button, you will see the popup asking you if you would like to scan the image. It is recommended that you press the 'Crop' button to crop your image to just contain the actual ingredient text, for better results.

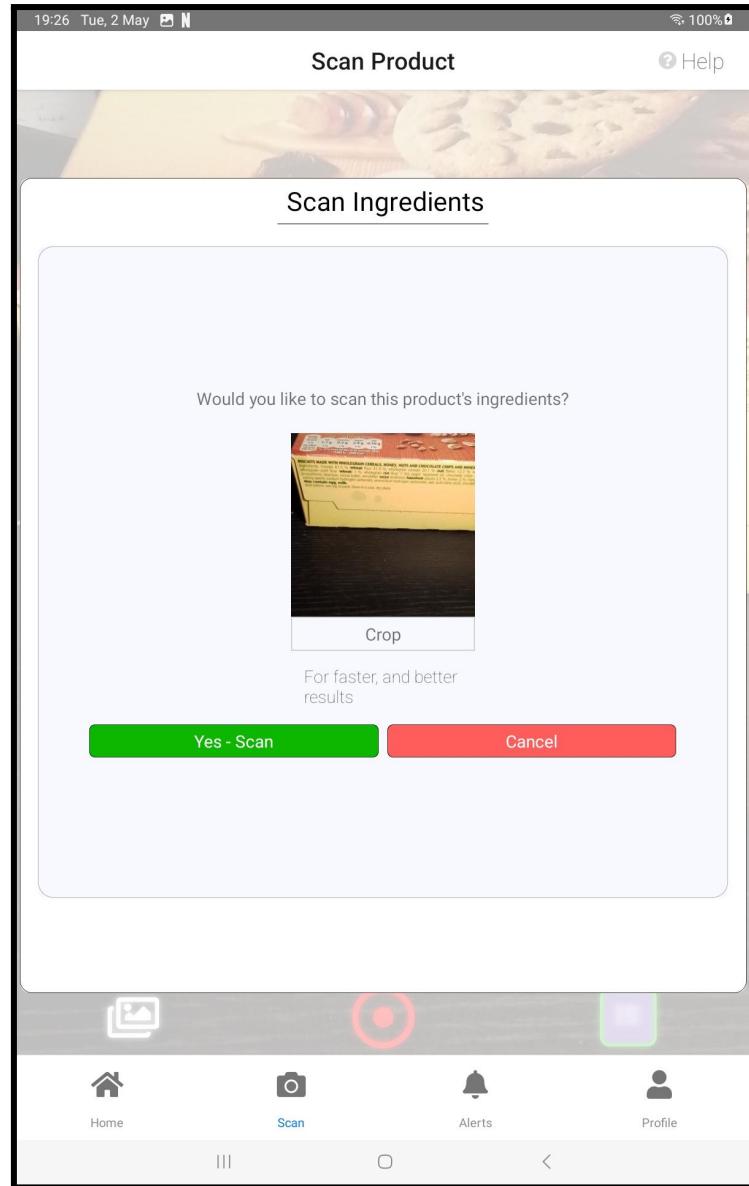


Figure 62.

2.8.2. Interpreting Ingredients Scan Result

First, you will see your image you have selected which has been edited (grayscale, denoised etc.) by the system to try to get more accurate results. Your results are already fully determined by the time you have reached the result screen.

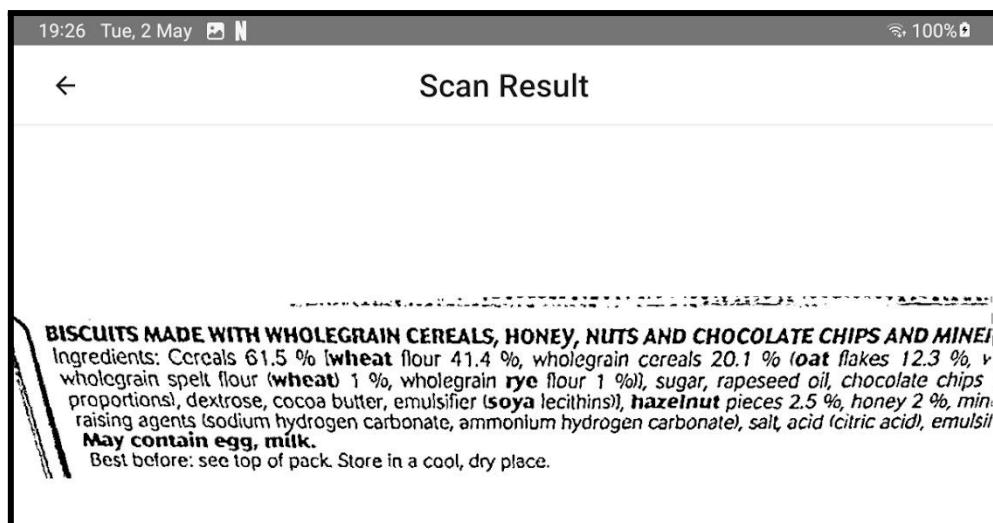


Figure 63.

These are the types of safety indicators you can expect below:

If none of your user allergens were detected in the image, you will be shown 'Safe to eat'.

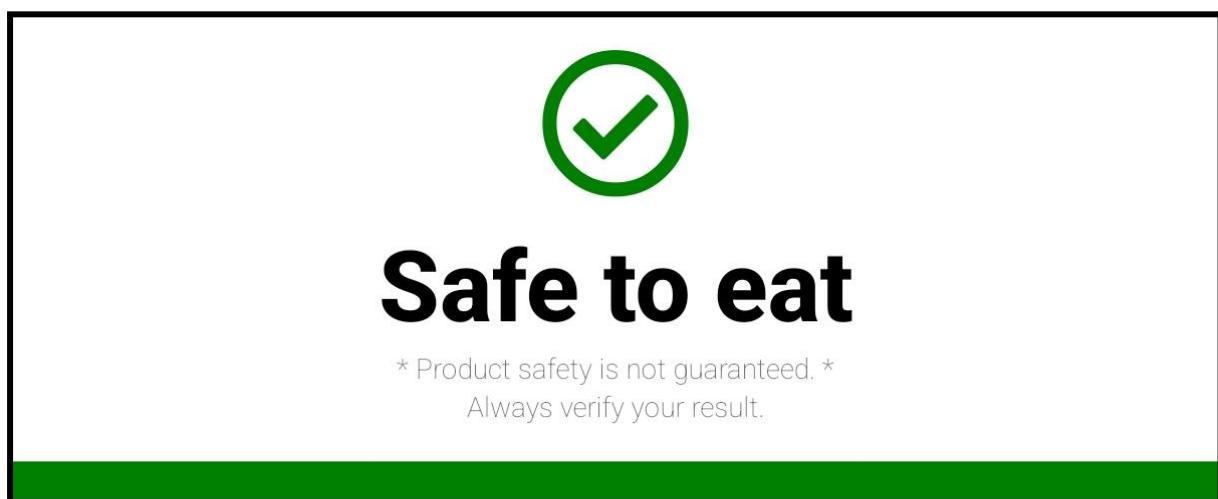


Figure 64.

If any of your user allergens were certainly detected in the image, you will be shown ‘Not safe to eat’.



Figure 65.

If a word similar to any of your user allergens is detected in the output text, then ‘May not be safe to eat’ will be shown, provided that it didn’t detect other certain allergies. E.g. If the text recognition picks up ‘eg9’, it will still warn you about ‘eggs’.



Figure 66.

Below the safety indicator, you will find allergens found from your profile or any others. There are also allergens that may have been found from your profile or any others, this may be because the image was not taken in the ideal conditions.

The image shows a smartphone screen displaying a food allergy detection app interface. At the top, a large red banner indicates 'No major allergens found'. Below this, the word 'Results' is displayed in bold black text. The interface is organized into several sections:

- Allergens found based on your profile:** A list containing Hazelnuts, Eggs, and Milk.
- Allergens that may have been found based on your profile:** A list containing N/A.
- Other Allergens found...**: A list containing Peanuts, Almonds, Walnuts, Cashew Nuts, Brazil Nuts, Gluten, Wheat, Oats, Rye, and Soybeans.
- Other Allergens that may have been found:** A list containing Lupin.

At the bottom of the screen, there is a navigation bar with four items: Home (represented by a house icon), Scan (represented by a camera icon, which is highlighted in blue), Alerts (represented by a bell icon), and Profile (represented by a person icon).

Figure 67.

2.8.3. View Full Output Text

You can view the full output text of the text recognition by pressing the 'View Output Text' dropdown at the bottom of the Ingredients Scan Result screen.

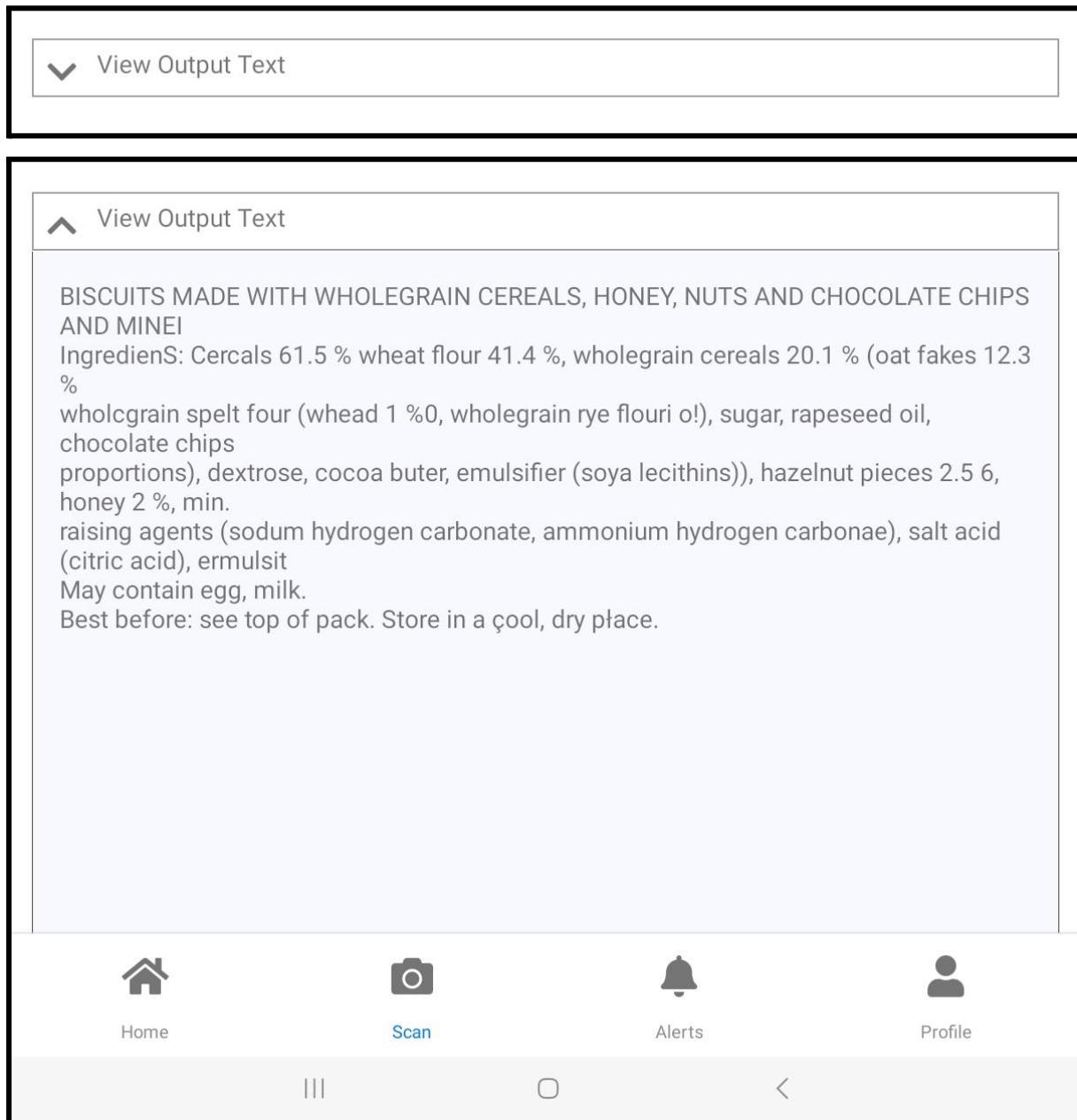


Figure 69.

2.8.4. View the Allergens Detected Table

There is a table to view the allergens that the app detected from the output text, allergens in **bold** are *your allergens*, while others not in bold are not from your profile. This can be used to help verify your result.

The screenshot shows a mobile application interface titled "Scan Result". At the top, there is a header bar with the time "19:26 Tue, 2 May", battery level "100%", and signal strength icons. Below the header, the title "Scan Result" is centered above a section labeled "Other Allergens that may have been found". A single entry "Lupin" is listed under this section. Below this, another section is labeled "Allergens listed as...". A table is displayed with two columns: "Allergens detected" and "Listed as". The table lists various allergens, some of which are bolded to indicate they are from the user's profile. The entries are:

Allergens detected	Listed as
Hazelnuts	nuts, hazelnut
Eggs	egg
Milk	oil, butter, milk. best
Peanuts	nuts
Almonds	nuts
Walnuts	nuts
Cashew nuts	nuts
Brazil nuts	nuts
Gluten	wheat, (wheat, rye, dry)
Wheat	wheat, (wheat)
Oats	(oat
Rye	rye, dry
Soybeans	(soya
Lupin	in

At the bottom of the screen, there is a button labeled "View Output Text" with a dropdown arrow icon. The footer contains four navigation icons: "Home" (house), "Scan" (camera), "Alerts" (bell), and "Profile" (person). The "Scan" icon is highlighted in blue, indicating it is the active screen.

Figure 70.

2.8.5. The Current Capabilities of Ingredient Scanning

Note: Unlike for barcodes, the scan results of ingredients are not saved in **Scan History** and output text is not translated. Therefore ingredient scanning only works with English text currently, although with greater demand, we may make this possible in the future. This is mentioned in the Help screen, as shown in the image below.

Note: Currently scanning ingredients only works for English text, but we plan on adding translation in the future so you can scan text from any language.

Figure 71.