User Manual
Aptean Food and Beverage ERP

Dynamic Production

Product Documentation

aptean

Contents

Release notes

Article • 10/22/2025 • 1 min read

To view what's new in each release of the Aptean Dynamic Production extension, select the specific release version.

Date	Release version	Description
October 2025	2501.0.0.0	Initial release

2501.0.0.0

Release Note • 10/22/2025 • 2 min read

Features

With the features added in this release of the Aptean Dynamic Production extension,

- The system automatically recalculate ingredient quantities based on the potency of assigned lots to ensure batches achieve target potency specifications. For more information, see Recalculate ingredient quantities.
- You can define product formulas with active ingredient requirements and establish relationships between active and dependent ingredients to maintain intended weight/volume ratios. For more information, see Set up active ingredient formulas and Define active-dependent ingredient relationships.
- You can mark items as potency-controlled with defined acceptable potency ranges and record actual potency percentages for each lot upon receipt. For more information, see Set up items as potency-controlled and Set up active potency.
- Integrate quality checks to validate ingredient potency upon receipt and finished product potency upon production completion with item attribute validation. For more information, see Set up potency quality control.
- Track active quantity on hand based on potency levels, enabling production planners to filter available lots and make informed decisions for sensitive formulas. For more information, see Set up active potency.
- The system calculates deviations resulting from potency-based changes rather than treating them as initial deviations, ensuring more accurate tracking of ingredient adjustments. For more information, see Calculate deviation.

Integrations

The Aptean Dynamic Production extension has been integrated with the following extensions:

- Aptean Inspection Status
- Aptean Advanced Attributes

For more information, see Integrations.

Introduction

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The Aptean Dynamic Production (DYP) extension ensures end-to-end accuracy and regulatory compliance through automatic ingredient quantity adjustments. You can define active ingredient formulas that automatically recalculate ingredient quantities based on the actual potency of assigned lots. When creating production documents, the system validates the defined requirements and displays error or warning messages accordingly. This ensures that production occurs only with properly balanced ingredient quantities to achieve target potency.

The key benefits of this extension are:

- Ensures that production complies with regulatory and quality standards by automatically adjusting potency variations.
- Reduces waste and improves efficiency by precisely calculating required ingredient quantities based on actual lot potency.
- Improves ingredient management for better production efficiency and quality control.
- Maintains consistent product quality by automatically adjusting for potency variations in raw materials.
- Supports complex formulation requirements with dependent ingredient relationships and filler adjustments.

Setup

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The following setups are required:

- Manage permission sets
- Set up active ingredient formulas
- Set up items as potency controlled
- Set up lot attribute

Manage permission sets

Article • 10/22/2025 • 2 min read

Permission sets in Business Central define a user's access level to various features and data within this extension.

We provide the following system permission sets:

- Direct
- Indirect

Direct permission sets

Users with this permission set can perform specific actions directly without requiring additional approvals or workflows. These sets include permissions to read, modify, delete, and create data.

The direct permission set ID for this extension is *DYNPROD196FDW*.

Indirect permission sets

Users with this permission set can perform specific actions. This is used in conjunction with other permission sets to allow you to perform certain actions. These permissions typically involve additional conditions or approvals before the action can be completed.

The indirect permission set ID for this extension is *DYNPRODBASIC196FDW.*

User-defined permission sets

In addition to the system permission sets we provide, you can create new permission sets or copy system permission sets and modify or delete access to specific entities according to your requirements. For more information, see Assign permissions to users and groups.

Assign a permission set

1. Select the Search icon, enter **Users**, and then choose the related link.
   The **Users** list page opens.
2. Navigate to the username for which you want to assign the permission set and select it.
   The **User Card** page opens.
3. On the **User Permission Sets** FastTab, in the **Permission Set** field, enter the valid permission set for this extension.

The associated fields are automatically updated based on the entered value.

The user has the necessary permissions to use the features of the Aptean Dynamic Production extension, ensuring secure and role-based access.

Set up active ingredient formulas

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You can define formulas (production BOMs) in terms of the active ingredient quantities needed, rather than just physical quantities. This allows for more precise control over the actual active content in your products.

To understand the active unit of measure functionality, follow these steps below:

Define active requirements: A production BOM line can reference the active UOM for potency-controlled components, marking the line as an *Active Ingredient* type. For example, A vitamin C supplements formula might require 50 grams of vitamin C active content. The BOM would specify 0.05 KAI (kilograms of active ingredient) of the vitamin C ingredient.

Automatic physical quantity translation: During production planning, the system translates the active requirement into a physical quantity based on the expected potency.
For example, if the standard (target) potency is 95%, and the active requirement is 0.05 KAI, then:

- The system calculates the required physical quantity as 0.05263 kg of raw material.
- Calculation: 0.05263 kg × 95% = ~0.05 kg active content.

Display both quantities: The production order component list shows:

- Required active quantity (e.g., 0.05 KAI)
- Provisional physical quantity (e.g., 0.05263 kg)

To configure an item with active UOM, follow these steps:

1. Navigate to the **Item Card** page for the potency-controlled ingredient.
2. On the action bar, select **Related** > **Item** > **Units of Measure**.
   The **Item Units of Measure** page opens.
3. On the action bar, select **New**.
4. In the **Code** field, enter the active UOM code (e.g., KAI for kilograms of active ingredient).
5. In the **Qty. per Unit of Measure** field, enter the conversion factor based on target potency.
   For example, if the target potency is 95% and the base UOM is KG, the system updates 0.95.

The item is configured to support active UOM formulation.

Set up active potency

Article • 10/22/2025 • 3 min read

You can set up a unique identifier for the potency attribute that the system must display as a lot of attribute for active quantity calculations.

To set up active potency tracking, follow these steps:

1. Select the Search icon  , enter **Advanced Attribute Setup**, and then choose the related link.
   The **Advanced Attribute Setup** page opens.
2. On the **General** FastTab, in the **Active Potency Lot Attribute** field, select a lot attribute with **Type** field set to *Decimal*.

> **Note**
>
> If the **Active Potency Lot Attribute** field value is left blank, active quantity calculation cannot be executed.

You can view the selected **Active Potency Lot Attribute** field value for production documents on the **Lot Attribute Values** page.

Configure on-hand tracking

You can configure the system to display active quantity on hand based on potency levels, enabling production planners to make informed decisions for sensitive formulas.

Calculate the active quantity for the selected items.

The system automatically calculates and displays the **Active Quantity On Hand** field value on the **Lot No. Information List** page using the following formula:

Active Quantity = Quantity On Hand × (Actual Potency / Target Potency)

The calculation process and related conditions,

Uses the **Unit of Measure** field value to find the related **Item Unit of Measure** conversion against the base unit of measure.

Multiplies the **Quantity On Hand** field values with the potency factor.

For Example: If the item's unit of measure setup has the target potency at 95% and the lot has an actual potency of 90%, and the quantity on hand is 10, then:

- Active Quantity = 10 × (90/95) = 9.47
- If the item unit of measure setup does not exist, the system does not calculate any value.
- If the unit of measure is not set up in the lot attribute, the system does not calculate any value.

The on-hand tracking is configured to show active quantities based on potency levels, allowing production planners to filter and select lots based on their active ingredient content.

Set up items as potency-controlled

Article • 10/22/2025 • 2 min read

You can mark items as potency-controlled with defined acceptable potency ranges to ensure accurate tracking of active ingredient content within inventory.

To set up item attributes for potency tracking, follow these steps:

1. Select the Search icon  , enter **Item Attributes**, and then choose the related link.
   The **Item Attributes** page opens.
2. In the **Type** field value, select *Integer* or *Decimal*.

> **Note**
>
> If a lot or item attribute is assigned to an item/lot, ensure that the **Type** field value cannot be changed.

3. In the **Unit of Measure** field, enter the unit of measure.
4. Navigate to the **Item Card** page for the relevant item.
5. On the action bar, select **Attributes** >**Item**.
   The **Item Attribute Values** page opens.
6. In the **Attribute** field, select *Potency*.
7. In the **Max** and **Min** fields, enter the maximum and minimum attribute value of the item.

> **Note**
>
> The maximum value must be higher than the minimum value, and vice versa. The system displays an error message if the values are entered incorrectly.

8. In the **Value** field, enter the target potency value for the item.
   The item is marked as potency controlled.

Set up lot attribute

Article • 10/22/2025 • 3 min read

You can set up lot attributes to record and validate actual potency percentages for each lot upon receipt.

To set up lot attributes, follow these steps:

1. Select the Search icon , enter **Lot Attributes**, and then choose the related link.
   The **Lot Attributes** page opens.
2. In the **Type** field value, select *Integer* or *Decimal*.
   The Unit of Measure field value is inherited from the **Unit of Measure** field value on the **Item Attribute Values** page.
   The **Min** field value is inherited from the **Min** field value on the **Item Attribute Values** page.
   The **Max** field value is inherited from the **Max** field value on the **Item Attribute Values** page.
3. In the **Related Item Attribute** field, select the attribute and their associated **Max** and **Min** field values are updated.
   > [!NOTE]
   > The **Unit of Measure**, **Min**, and **Max** field values are not editable when the **Related Item Attribute** field value is selected.
4. Navigate to the **Lot No. Information List** page.
5. On the action bar, select **Actions** > **Attributes**.
   The **Lot Attribute Values** page opens.
6. In the **Attribute** field, select *Potency*.
   The system inherits the **Unit of Measure**, **Max** and **Min** field values on the **Item Attribute Values** page.

> **Note**
>
> The system notifies an error message when the entered value in the **Value** field is less than the **Min** field value and greater than the **Max** field value.

The lot attributes are set up for potency tracking, and actual potency values will be validated against the acceptable ranges defined for the item.

Set up potency quality control

Article • 10/22/2025 • 2 min read

You can integrate quality checks to validate ingredient potency upon receipt and finished product potency upon production completion.

To set up potency quality control, follow these steps:

1. Select the Search icon  , enter **Quality Control Questions**, and then choose the related link.
   The **Quality Control Questions** page opens.
2. On the action bar, select **New**.
3. In the **Question Type** field, select the *Lot Attribute* option.
4. In the **Lot Attribute** field, select *Check and Set* to validate against lot attribute ranges and set values regardless of pass/fail status.
5. In the **Lot Attribute Name** field, select the required lot attribute for potency validation.
6. Navigate to **Quality Control Plans** page.
7. Create a quality control plan that includes potency as a question. For more information, see Quality control plans.

> **Note**
>
> If the item attribute is not defined, the system displays an error message.

The potency quality control is configured.

The system automatically triggers potency tests when:

- Incoming lots are received (via purchase order quality control)
- Production batches are completed (via production order quality control)

Recalculate ingredient quantities

Article • 10/22/2025 • 3 min read

You can automatically recalculate ingredient quantities based on the actual potency of assigned lots to ensure the target potency is achieved. This process is only available for production orders in firm planned status.

Recalculating a single lot

For single-lot assignments, the system uses the formula:

Required Quantity = (Target Potency / Lot Potency) × Original Quantity

For example, if a formula calls for 10 kg at 100% potency and a lot with 80% potency is assigned, the system updates the required quantity as 12.5 kg (10 × 100/80).

Conversely, if a lot with 120% potency is assigned, the required quantity is reduced to approximately 8.33 kg (10 × 100/120).

Recalculate multiple lots

For multi-lot assignments, the system calculates the adjusted required quantity for each lot to ensure the total active ingredient meets the formula requirement.

The system distributes the total active requirement across lots based on:

- Initial allocation proportions
- Available lot quantities
- Potency variance from target

For example two lots requiring 50 active units:

- Lot A: 85% potency
- Lot B: 95% potency

The system apportions the load so that the weaker lot contributes more weight and the stronger lot less, ensuring the combined active content equals the required 50 units.

Each lot's quantity is computed as: (Target Potency / Lot Potency) × Initial Allocation

Compensating and filler ingredients

When the actual potency of an active ingredient differs from the standard (target) potency, the system automatically adjusts the quantities of related components to maintain the intended formula balance and total batch size. These adjustments depend on the type of relationship the component has with the active ingredient.

- Dependent ingredients (Fixed Ratio): Adjusted according to their defined ratio to maintain the specified proportion.
  - For example: If active increases by 20%, a dependent with a 1:4 ratio also increases by 20%.
- Filler ingredients (Balance to Total): Inversely adjusted to maintain total batch size.
  - For example: If active increases by 5 mg, filler decreases by 5 mg to keep tablet weight constant.

The system ensures that tablet mass or batch weight remains constant while achieving correct active content.

Adjust relationship sequence

The system processes adjustments in the following order:

- Adjust active ingredient quantities based on lot potency
- Adjust dependent ingredients with fixed ratio relationships
- Adjust filler ingredients to maintain total batch weight
  - Validate that all relationships are satisfied

This prevents circular or oscillating adjustments.

The production document is created with potency validation applied.

Release a production document

You can release production documents after the system validates all potency requirements.

The system performs the following validations before releasing:

- Potency-controlled components have valid lot assignments
- Calculated quantities achieve target potency specifications
- Dependent ingredient relationships are satisfied
- Quality control requirements are met (if configured)

When posting a production document, the system performs final validation and records actual potency achievements.

Define active-dependent ingredient relationships

Article • 10/22/2025 • 5 min read

You can establish relationships between active ingredients and dependent ingredients to maintain intended weight/volume ratios when ingredient quantities are adjusted due to potency variations.

The system supports two types of relationships:

Fixed ratio relationship

The dependent ingredient is used in a fixed proportion to the active ingredient. When the active ingredient quantity changes, the dependent ingredient changes by the same factor to maintain the specified ratio.

Example: A recipe uses a 1:4 ratio of active ingredient to carrier (by weight). If the active ingredient increases from 10 kg to 12 kg due to potency adjustment, the carrier automatically increases from 40 kg to 48 kg.

Filler/Balance to total relationship

The dependent ingredient serves as a filler to achieve a desired total batch weight or volume. This ensures end-to-end accuracy and regulatory compliance.

For example: A tablet must weigh exactly 500 mg. If the active ingredient increases from 50 mg to 55 mg due to low potency, the filler automatically decreases from 450 mg to 445 mg to maintain the 500 mg total.

Set up BOM component relationships

To define relationships between active and dependent ingredients, follow these steps:

1. Select the Search icon , enter **Production BOMs**, and then choose the related link.
   The **Production BOMs** list page opens.
2. Select the production BOM for which you want to define relationships.
   The **Production BOM** page opens.
3. On each BOM line, configure the **Component Type** field,

   - Select *Active Ingredient* for the primary active component.
   - Select *Dependent Ingredient* for components that should adjust based on active ingredient changes.
   - Select *Filler* for components that balance the total batch weight.
     For lines marked as *Dependent Ingredient*, *Filler*, or *Active Ingredient* related field values become editable.

4. In the **Active Ingredient Line No.** field, enter the line number of the active ingredient that this component depends on.
5. On the action bar, select **Ingredient Relationships**.
   The **Relationships for BOM** page opens, showing all defined relationships for the current BOM.
6. On the **Relationships for BOM** page, configure each relationship:
   Fixed ratio relationships

   - Use this when one component quantity is defined as a fixed ratio of another.
   - In the **Ratio Value** field, enter the ratio value.
     For example: Enter 4 for a 1:4 relationship.The system maintains the following relationship:
     Dependent Quantity ÷ Active Quantity = Ratio

   For filler/balance to total relationships:

   - Use this when the total weight or volume of the formula must remain constant, and one component should make up the remainder.
   - In the **Relationship Type** field, select **Filler/Balance to Total**.
   - In the **Total Weight/Volume** field, enter the target total.
     For example: Enter 500 for 500 mg tablets. The system maintains the following relationship:
     Active Quantity + Dependent Quantity = Total Weight/Volume
7. The **BOM Total** field displays the sum of all **Quantity per** value on the production BOM lines, helping you verify that relationships are configured correctly.

The system enforces the following rules:

- One dependent ingredient can only link to one active ingredient (no ambiguous multiple active influences).
- Multiple dependent ingredients can link to the same active ingredient.
- Circular relationships are not allowed.

View relationships on the FactBox

You can see the component relationships on the **BOM Relationships** FactBox of a production BOM or **Production Order** FactBox:

1. Navigate to the **Production BOM** or **Production Order** page.
2. Select a component line.
   The **BOM Relationships** FactBox displays:

   - Whether the selected line is an active ingredient with dependents.
   - If the line is a dependent, which active ingredient it is linked to.

- The type of relationship and its parameters, such as ratio or total.
  The BOM component relationships are defined and automatically adjust dependent ingredient quantities when active ingredients change due to potency variations.

Manage production documents

Article • 10/22/2025 • 3 min read

You can create production documents that automatically implement potency-based quantity adjustments and validation rules.

To create a production order, follow these steps below:

1. Select the Search icon  , enter **Production Orders List**, and then choose the related link.
   The **Production Orders List** page opens.
2. On the action bar, select **New**.
   The **Production Order** card page opens.
3. In the **Source Type** field, select *Item*.
4. In the **Source No.** field, select the item with a potency-controlled BOM.
5. On the **Lines** FastTab, the system automatically populates component lines from the production BOM.
   Each component line includes key information to help you understand how it fits into the overall BOM structure. The **Component Type** field indicates whether the line is classified as an *Active Ingredient*, *Dependent Ingredient*, or *Filler*. For dependent and filler components, the **Active Ingredient Line No.** field shows the line number of the linked active ingredient. The **Expected Quantity** field displays the calculated quantity based on the target or standard potency defined for the active component.
6. On the action bar, select **Recalculate Ingredient Quantities** to recalculate the field values.

> **Note**
>
> The production order must be in **Firm Planned** status before you can perform potency-based quantity recalculation.

Calculate deviation

Article • 10/22/2025 • 1 min read

The system calculates deviations after potency-based adjustments for an item to provide accurate tracking of ingredient variations.

Understanding deviation calculation

Traditional deviation calculations compare actual consumption against the original formula quantity. However, with potency adjustments, it incorrectly selects potency-driven changes as deviations.

After adjusting for potency, the system recalculates the required quantities based on the actual potency of the assigned lot. These recalculated quantities then become the new baseline for measuring deviation. Any differences between the actual consumption and this potency-adjusted baseline are considered as true deviation.

For exmple, a formula specifies 10 kg of an ingredient at 100% potency. However, the assigned lot has only 90% potency, so the system adjusts the required quantity to 11.11 kg to compensate.

During production, the actual consumption recorded is 11.50 kg.

As a result:

- The new baseline for comparison becomes 11.11 kg, based on the potency adjustment.
- The deviation is calculated as:
  11.50 kg (actual) - 11.11 kg (baseline) = 0.39 kg, which equals a 3.5% deviation.

The system reports only this true variance from the adjusted baseline, ensuring accurate and meaningful deviation tracking.
Deviation calculations are automatically applied when posting production orders with potency-controlled ingredients.

Integrations

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The Aptean Dynamic Production extension has been integrated with the following extensions:

- Aptean Advanced Attributes
- Aptean Inspection Status

Aptean Inspection Status

Article • 10/22/2025 • 1 min read

The Aptean Inspection Status extension must be installed to use the Aptean Dynamic Production extension to automatically control the availability of lots based on potency test results and quality control outcomes.

Aptean Advanced Attributes

Article • 10/22/2025 • 1 min read

The Aptean Advanced Attributes extension must be installed to use the Aptean Dynamic Production extension to enable potency tracking, attribute-based quality control, and active quantity calculations for production planning.