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FORMULATION AND EVALUATION OF CHEWABLE TABLET: AREVIEW

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Abstract:

Chewable tablets are the solid dosage forms which are crushed and Before being ingested, it ischewed between the teeth. chewable tablets are prescribed to them who are not willing to swallow whole tablet or unable to swallow the whole tablet. These pills are formulated to dissolve very easily in oral cavity. Chewable pills have a smooth texture regardless of whether they are chewed or not. dissolution, have a good flavour, and do not leave a harsh or disagreeable aftertaste. Patients in the geriatric and paediatric age groups and patients on the go who may not have simple access to water are in desperate need of an easy-to-swallow dosageChewable pills are one example. To fulfil the basic needs for the the chewable tablet flavouringagent is added.there are some factors which are involved in the formulation of chewable tablet these are as follows. Flow, lubrication, disintegration, organoleptic qualities, compressibility, compatibility, and stability. A formulator can be apply one or more than one method to get thebest result for the formulation with good taste , smooth texture, acceptable compressibility andstability.

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INTRODUCTION

The most preferred administration route of the medication for eliciting pharmacological actions on a systemic level is oral drug delivery.[1] However, various challenges exist for patients, both young and old, to take their oral medications, including swallowing difficulty or dysphagia, caregiver participation, child unwillingness, and polypharmacy in the older age.[2,3]The frequency of oral solid dosage form swallowing difficulties, particularly among pediatrics[4] and geriatrics[5,6], is a serious issue since it can limit patient compliance with medicine intakes. Most marketed drugs' solid dose forms are swallowing is difficult or impossible for children and infants, according to Freed et al. Most marketed compounds have solid dose forms that are difficult or impossible for toddlers and infants to ingest. [5,6] Chewable tablets are a common dose form for pharmaceutical, nutraceutical, and veterinary active ingredients. Chewable tablets are those that are designed to be chewed in order to facilitate the release of the active component (s). Chewable tablets provide advantages over traditional tablets in terms of manufacturing, dosing precision, mobility, and long-term stability as a dose form. Chewable tablets also make swallowing easier because the product is first broken down into particles in the mouth.[7,8] When the active ingredient is meant to operate locally rather than systemically, chewable tablets are frequently used. A pleasant chewable tablet is one that can be chewed and swallowed without much or no water. The wet granulation procedure or direct compression are the most common methods for producing chewable tablets. Micronized and submicron versions of therapeutically and physiological effective substances are used to take advantage of these forms' improved absorption properties.[9]

ADVANTAGES

- Because it skips the disintegration phase, it has a higher bioavailability.
- Chewable tablets have a pleasing taste, which increases patient acceptance.
- Because the tablet does not require water to ingest, it is very convenient for the patient.
- Chewable tablets absorb more quickly than regular tablets.
- Chewable tablets have an advantage over large tablets since they are easier to consume.
- Chewable tablets do not require any extra excipients in their formulation; they are identical to normal tablets.
- When a rapid beginning of action is necessary, an alternative to liquid dosage formscan be used.

DISADVANTAGE

- The majority of chewable tablets contain sorbitol as an excipient, which causes diarrhoea and flatulence.
- Flavoring compounds may induce mouth ulcers, and prolonged chewing may result in face pain.
- Because it is hygroscopic, it should be stored in a dry location.

FORMULATION FACTORS

There are several aspects to chewable tablet composition. Flow, lubrication, disintegration, and organoleptics are all terms used to describe how something works. characteristics, and All of these factors play a role in the formulation. elements. Regular people value compatibility and stability. Organoleptic (swallowed) and chewable tablets, on the other hand, The active drug ingredients' characteristics are of primary importance.[9] here To arrive at a formula, a formulator may employ one or more procedures. finding a formula and process combination that produces a product with excellent organoleptic qualities This chemical should have appropriate qualities of flow, compressibility, and stability.[10]

TASTE & FLAVOUR

Taste is a sensory reaction that occurs when the taste receptors on the tongue are chemically stimulated. Salty, sour, sweet, and bitter are the four basic flavours. Salty and sour flavours come from chemicals that can ionise in a solution. Many organic therapeutic substances elicit a bitter response despite their inability to ionise in an aqueous solution. The majority of saccharides, disaccharides, some aldehydes, and a few alcohols are sweet. Tasteless refers to a substance that does not stimulate the buds' sensory receptors. The term "flavour" refers to a certain combination of taste and smell sensations. Sugar, for example on the other hand, has a sweet flavour but no aroma, whereas honey has both a sweet flavour and a distinct aroma. [11]

AROMA

Aromas are the collective term for pleasant odours. A well-formulated orange-flavored chewable pill, for example, should have the sweet and tart taste and aroma of fresh orange.[11]

MOUTH FEEL

This word refers to the feeling or touch that a tablet

provides gives off in oral cavity when chewed. As a result, it has nothing to do with olfactory nerve or taste bud stimulation. However, the overall action in the mouth is critical to the success of a composition. Gritty (e.g., calcium carbonates) or sticky texture is often disliked, whereas calming and cooling sensations (e.g., mannitol) with smooth texture are favoured.[12]

AFTER EFFECT

Aftertaste is the most prevalent side effect of numerous substances. Some irons, for example, have a "rusty" aftertaste, while saccharin in excessive doses has a bitter aftertaste.

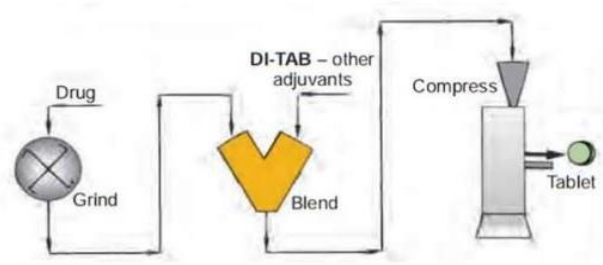
A numbing feeling of a portion of the entire surface of the tongue and mouth is another commonside effect. Antihistamines with a bitter taste, such as pyribenzamine hydrochloride and promethazine hydrochloride, are common in this class.

Methods used in the preparation of tablets [9,10]

- Direct Compression
- Dry Granulation
- Wet granulation

DIRECT COMPRESSION METHOD

Direct compression is used after components have been combined and pills have been formed using a pill press with no changes to the ingredients. This approach isn't commonly utilized since numerous tablets contain active pharmaceutical ingredients that may fail to highlight content consistency for Direct compression [9,10].



DRY GRANULATION

Granulation is a technique for moving particles by forming links between them. Without the use of heat, the powder is compacted or alternate solvents in the dry granulation technique. The two essential operations are to compress the material into a compact and then mill it to obtain granules. Dry granulation is done in two different methods. Slugging is the most widely used procedure, in which powder is recompressed and the final pill is polished to obtain granules. Pre-compressing the powder with pressure rolls exploitation machines like the chilsonator [9,10] is the

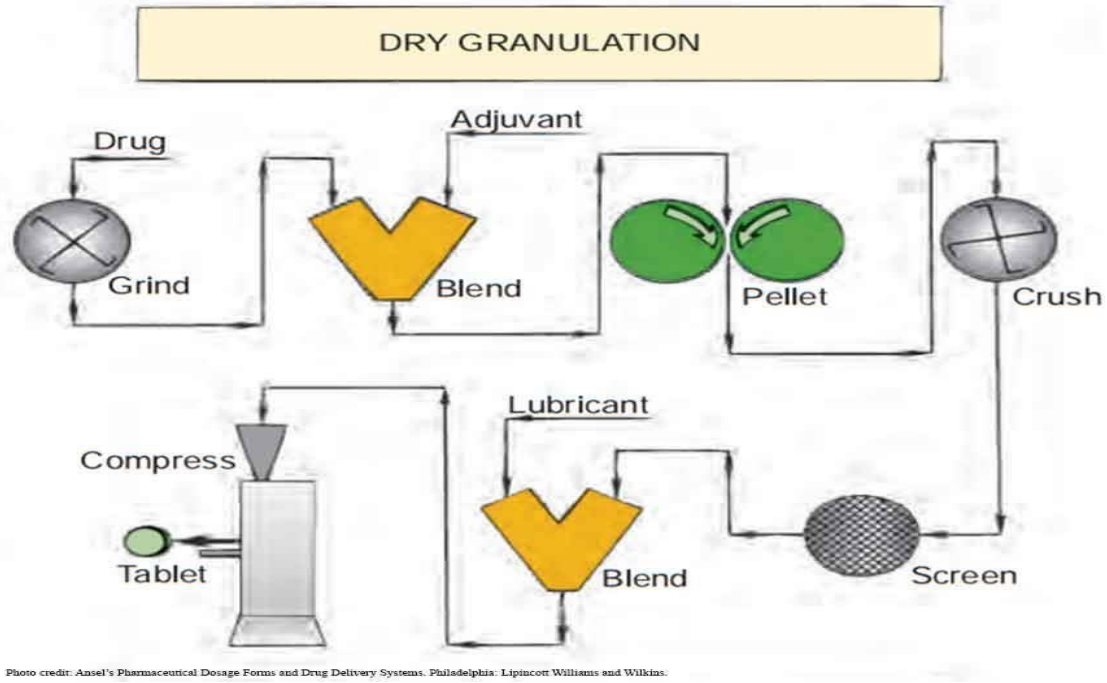
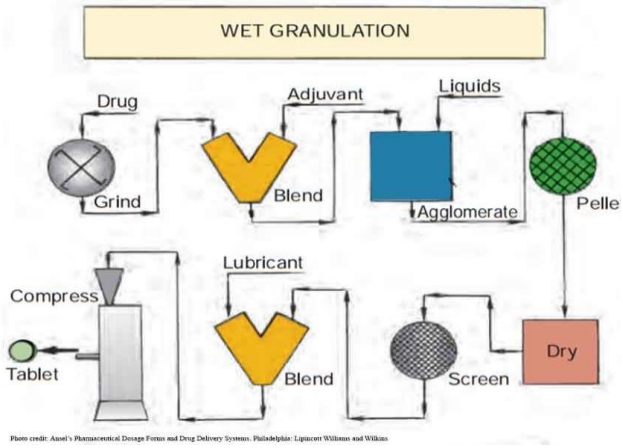


Photo credit: Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. Philadelphia: Lipincott Williams and Wilkins.

WET GRANULATION

In the pharmaceutical industry, it is most commonly treated for granulation. Wet granulation is simply the process of mixing powder with granulating liquid, sizing it, and drying it. The steps of granulation are as follows:

- Medication and receivers are mixed together.
- Binder response preparation.
- Mixing the binder solution with the powder to make a wet ass.
- Wet granules are dried.
- Disintegrant, glidant, and material are mixed with screened granules [15,16].



STABILITY FACTOR

PRE-COMPRESSION FACTOR.

ANGLE OF REPOSE.

The stability factor that characterises the flow properties of powder is the angle of repose. For better flow properties, the angle of repose should be low; if the angle of repose is large, the flow property of the powder will be low. [16]

Angle of repose		**Flow ability**
<25	=	**excellent**
25-30	=	**good**
30-40	=	**poor**
>40	=	**very poor**

HAUSNER'S RATIO

This is the ratio of tapped density to poured density. Powders that flow freely (low interparticular friction) had a ratio of less than 1.2, while powders that are more cohesive and hence less free flowing had a larger value (>1.5), according to Hausner. He established that this ratio predicts powder flow as it relates to interparticulate friction by doing so. [17,18]

C = TAPPED DENSITY – BULK DENSITY × 100
TAPPED DENSITY

POST COMPRESSION FACTOR

ORGANOLEPTIC PROPERTIES.

These are the attributes that include colour, taste, odour, texture, flavour, and aftertaste. These properties must be checked or visualized. [19]

HARDNESS.

The criterion that characterises the strength of a tablet is its hardness. Which allows it to survivehandling and packaging. The hardness of a chewable tablet should be in a range that allows it to be readily chewed by the consumer while also being strong enough to survive handling and packing. Pfizer and Monsanto hardness testers can determine the hardness of a tablet. [20]

WEIGHT VARIATION.

Weight variation testing of a batch of tablets is a technique for producing tablets of consistent weight. This test can be carried out by randomly picking 20 tablets from the batch. The average weight of these tablets is calculated by weighing all 20 tablets equally and comparing the weight of a single tablet with the average weight of 20 tablets. In these 20 tablets, there is a weight variation limit of two tablets. [20,21]

FRIABILITY TEST

Friability refers to the ability of a tablet to be broken as a result of friction or mechanical stress. This test evaluates the tablet's capacity to withstand the stress placed on it. In this test, tablets are selected at random from the batch, weighed, and then paced into the roche friabilator equipment, which rotates at 25 rpm. To complete 100 revolutions, this equipment moves for 4 minutes. After 100 revolutions, re-weigh these tablets. Weight differences should be fewer than1%. [22,23]

THICKNESS

The thickness of the tablets reveals their homogeneity. Micrometer and vernier calliper can beused to check it. The diameter of the tablet influences the thickness. It should be kept within a + 5% variance of the standard value. [24,25]

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