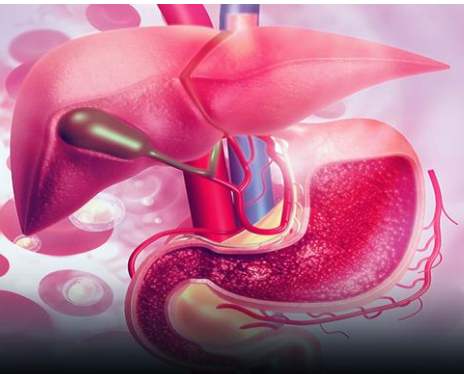


# Enteron



Dear Doctor,

Greetings from Micro Labs  
limited.

## Inside This Issue

- A Promising Malnutrition Screening Model for IBD 1
- Chicory inulin-type fructan on the human gut microbiota in low dietary fiber consumers 3
- Snacking on whole almonds for 6 weeks improves endothelial function and lowers LDL cholesterol but does not affect liver fat and other cardio-metabolic risk factors in healthy adults 6

Should you require any specific article or medical information, please feel free to contact us at [medicalservices@microlabs.in](mailto:medicalservices@microlabs.in)  
Looking forward to your valuable feedback

Best Regards,  
**Medical Team, Micro Labs Ltd**

## A Promising Malnutrition Screening Model for IBD

**R**esearchers recorded progress with a novel approach to resolve deficiencies in screening and malnutrition treatment in IBD patients with inflammatory bowel disease (IBD). The pilot-tested elements of IBD-Nutrition Care Pathway (IBD-NCP) under IBD Qorus, a joint learning program between patients and health care professionals funded by the Crohn's and Colitis Foundation, aimed at optimizing treatment.

According to Jason K. Hou, MD, of the Michael E DeBakey VA Medical Center and Baylor College of Medicine, both in Houston, and colleagues, the system efficiently evaluated over 2,000 IBD patients utilizing the current Qorus network and completed reviews of all patients and caregivers with regard to different elements of the treatment process.

Malnutrition levels in hospitalized IBD patients vary from 40 percent to 85 percent and in their ambulatory equivalents from 20 percent to 50 percent, they reported in *Clinical Gastroenterology and Hepatologie*. In fact, broad longitudinal trials and meta-analysis have found that malnourished patients have elevated inpatient deaths, decreased hospitalizations, and increased incidence of nosocomial infections.

But the authors say that there is need for gastroenterologists to step up in monitoring their IBD patients for dietary shortages given the negative effects correlated with this.

Caroline Hwang, MD of the Keck School of Medicine at Los Angeles University of Southern California, said they weren't successful at incorporating effective screening procedures in the health care industry as a whole. And this involves IBD which is what we would have been willing to address early on, considering that it is a recurrent GI disease. Yet we haven't, so part of that is that doctors aren't very well educated in nutrition and don't get great nutritious medical knowledge.



The pilot research was conducted around the nation at five university and three private practice sites involved in IBD Qorus. Such places reflected a broad range of styles of research focused on IBD specialist specialization, college association, scale of work and geography. Quantitative and qualitative reviews on elements of the IBD-NCP was collected before and after pilot training. The writers clarified that one of the main obstacles in IBD's analysis of the effects of malnutrition is the absence of systematic IBD diet screening programmes. Various malnutrition screening tools, including the Universal Screening Tool (MUST) for malnutrition and the Malnutrition Screening Tool (MS), have been tested for use throughout the acute care environment.

Throughout this research, participant patients were tested for the IBD-NCP consecutively using a updated variant of MUST (mMUST), which was uniquely tailored to fit outpatients and resolve IBD symptom behavior. In mMUST, measurement is based on BMI, estimated from self-reported height and weight, percentage of self-reported weight loss over the past 6 months, and a subscore for acute disease results. The IBD-NCP comprises of four stages: assessment, examination, action and follow-up.

Pilot research evaluated 2,388 patients and finished the entire study with 92 per cent. For those screened, 1,758 got input on the procedure, 93 percent recorded simple completion for mMUST, and 44 percent found nutritional screening important to their treatment. Among patients who completed mMUST, 72% were considered at low risk (mMUST=0), 10% were considered at medium risk (mMUST=1), and 18% were considered at high risk (mMUST=2). For IBD-NCP purposes, both low- and high-risk patients were deemed at risk of malnutrition, and suggested for more clinical assessment, including with a licensed dietitian.

Multiple barriers to reference have emerged, however. For example, many practitioners, including those with IBD-specific dietary therapy expertise, did not have access to registered dietary resources. Additionally, practitioners have also been reluctant to obey the guidelines of dietitians because they are unfamiliar with the procedure and treatments they prescribe. Several barriers to dietary referral have also been identified, including lack of insurance cover for dietary counseling services and lack of interest in dietary referral for some patients. To overcome such impediments, the IBD-NCP has been updated to explicitly identify and offer advice to patients and caregivers on particular areas of deprivation, which are more applicable to IBD patients and are practical for GI caregivers to conduct. This included symptoms which affected oral intake, food-avoiding habits, and deficiencies in micronutrients.

The authors stated that the IBD Qorus has the potential to continue serving as a platform for testing the development of IBD-NCP and other care pathways. They said they expected challenges to monitoring those at risk of malnutrition, and Dashboard-based population management methods that are currently under implementation under IBD Qorus would be directly evaluated to overcome such obstacles. The IBD-NCP offers a potentially practical method for individuals with IBD to track and treat malnutrition, which may allow more research to show progress in health results.



## Chicory inulin-type fructan on the human gut microbiota in low dietary fiber consumers

### INTRODUCTION

The fiber consumption guidelines set out by the US Institute of Medicine vary from 19 to 38 g / d, based on age and gender, while the European Food Safety Agency and the UK Scientific Nutrition Advisory Committee prescribe 25 and 30 g / d for adults, respectively. Despite these recommendations, there is a significant shortcoming in current fiber consumption, especially in western countries. This so-called dietary "fibre void" has important consequences for the usual physiological activity of the gastrointestinal (GI) tract as well as the prevention of several chronic diseases, which have been primarily linked to whole grains and cereal fiber to date. More recently, the essential function of dietary fiber has been identified in promoting a balanced gut microbiota, which has sparked interest in finding ways to improve habitual fiber intake in adults and children. Inulin-type fructans (ITF), inulin and oligofructose extracted from chicory, are known dietary fibers that have been shown to change the colonic atmosphere in favour of health-promoting bacterial organisms, most commonly *Bifidobacterium* and *Lactobacillus*.

The International Scientific Association of Probiotics and Prebiotics has recognized ITF as a prebiotic fiber, described as 'a substrate selectively used by host microorganisms that confer a health benefit.' The utilization of prebiotic inulin and oligofructose has also been shown to decrease body fat in addition to modifying the concentration of these and other bacteria; enhance appetite control; minimize inflammation; increase blood hormones such as leptin, glucose, and lipids; and boost bowel function. Several experiments have demonstrated the potential of ITF to improve the health-promoting bacteria in the stomach. For eg, *Bifidobacterium* spp increased in healthy adults who eat inulin or placebo for a duration of 3 wk (7.7 g / d for the first week, 15.4 g / d for the remainder). As well as reduced *Bacteroides* / *Prevotella* and pathogens were found in participants receiving inulin at the end of the test. Likewise, other experiments have demonstrated substantial changes in bifidobacteria with fermentable oligo and polysaccharides during a fairly short span of time – from 3 to 8 wk. The SCFAs butyrate, acetate, and propionate are the physiologically active by-products of bacterial fermentation of fibers like inulin and oligofructose.

If generated, SCFA serves as a source of energy for colonic epithelial cells, and may exert many other anti-inflammatory, immune, metabolic effects. With ITF's potential to change the fecal microbial profile & contribute to metabolic safety, the changes in microbial species occurring in stable individuals receiving differing amounts of such fermentable substrates need to be better understood. Since fiber diets are well below the average levels in the general population, low fiber users are an especially important category of individuals to research such results in. Authors' goal was therefore to investigate the impact of low- and moderate-dose ITF on the composition of gut microbiota in adults with poor dietary fiber consumption, utilizing 16S ribosomal RNA (rRNA) sequencing. Additionally, in response to low- and moderate-dose ITF, they examined inferred microbial function, fecal concentrations of SCFA, GI symptoms, dietary intake and quality of life (QOL).

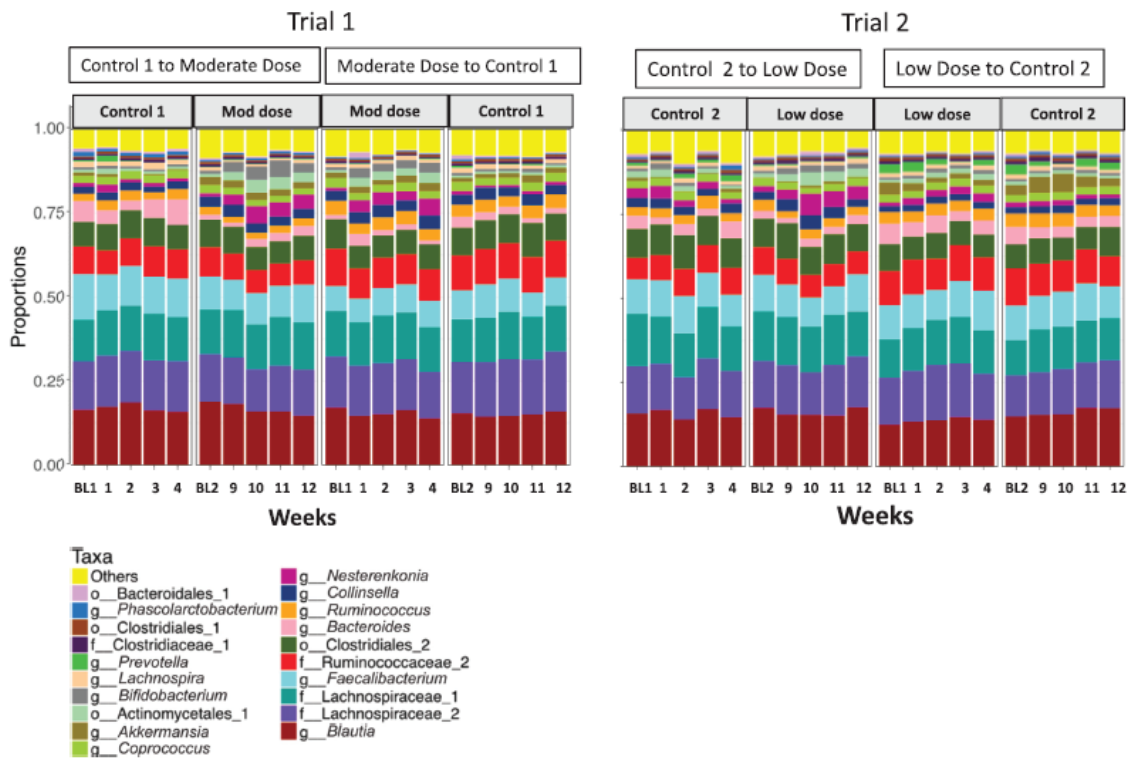


METHODS

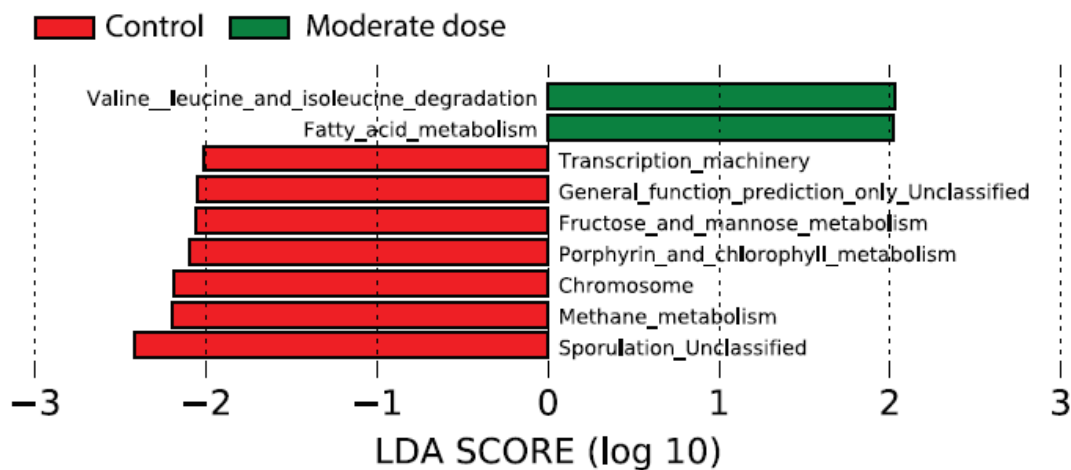
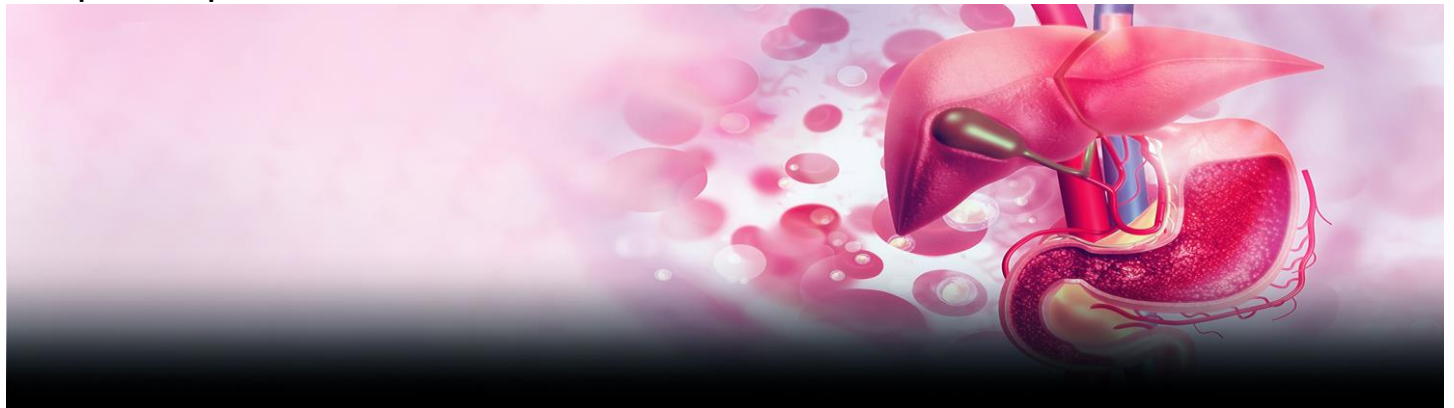
In 2 separate 4-wk, placebo-controlled, double-blind, crossover trials, 50 healthy adults with low dietary fiber intake were randomly assigned to receive isocaloric snack bars of either moderate-dose fiber (7 g/d) or control in Trial 1 (n = 25) or lowdose fiber (3 g/d) or control in Trial 2 (n = 25), with 4-wk washout periods. Fecal microbiota composition and inferred function, fecal SCFA concentration, gastrointestinal (GI) symptoms, dietary intake, and quality of life were measured.

RESULTS

Compared with the control group, the moderate-dose group showed significant differences across multiple microbial taxa, most notably an increased relative abundance of the Bifidobacterium genus from (mean ± SEM) 5.3% ± 5.9% to 18.7% ± 15.0%. With low-dose ITF, significant increases in Bifidobacterium were no longer present after correction for multiple comparisons but targeted analysis with qPCR showed a significant increase in Bifidobacterium. Predictive functional profiling identified changes in predicted function after intake of the moderate- but not the low-dose bar. Fecal SCFAs were affected by time but not treatment. There were no between-group differences in GI symptoms. Importantly, fiber intake increased significantly with the moderate- and low-dose bars.



Relative abundance of bacterial communities at various taxonomic levels in participants consuming Moderate Dose and Control 1 bars (Trial 1 or Low Dose and Control 2 bars (Trial 2) for 4 wk in a crossover design. n = 25, Trial 1; n = 23, Trial 2. BL, baseline; f, family; g, genus; o, order.



LDA effect size analysis and predicted functions of the fecal bacterial communities based on Phylogenetic Investigation of Communities by Reconstruction of Unobserved States analysis, showing pathways that are enriched in the microbiome when consuming the Moderate Dose bar compared with the Control 1 bar, n = 25. Only functional categories meeting a log LDA significant threshold value > 2.0 are shown (P < 0.05). LDA, linear discriminant analysis.

## CONCLUSION

A high dosage (7 g / d) of ITF in a snack bar substantially changes the structure of gut microbiota and the implied feature, whereas a low-dose (3 g / d) ITF-containing bar needs a focused quantitative method (qPCR) to identify rises in bifidobacterium. Seeing that the overwhelming majority of citizens in Western countries do not achieve the required consumption of fiber, one solution for growing intakes is the introduction of fibers such as ITF to food items. In this research, the introduction of ITF to snack bars improved the fiber consumption of low-fibre customers. Because the bars with 7- and 3-g doses of ITF tested in this study did not have significant symptoms of GI compared to control bars, the addition of ITF at low to moderate doses could represent a well-tolerated strategy to close the dietary fiber gap.

## REFERENCE

Reimer RA, Soto-Vaca A, Nicolucci AC, et al. Effect of chicory inulin-type fructan-containing snack bars on the human gut microbiota in low dietary fiber consumers in a randomized crossover trial, The Am Jour Clini Nutr. June2020; 111(6): 1286–1296

Snacking on whole almonds for 6 weeks improves endothelial function and lowers LDL cholesterol but does not affect liver fat and other cardio-metabolic risk factors in healthy adults



## INTRODUCTION

**C**ardiovascular disease (CVD) is the primary source of global mortality. CVD formation is accompanied by combined interrelated hemodynamic and metabolic abnormalities that evolve throughout the course of life and often function in the progression of type 2 diabetes (T2D) through pathophysiology. Dietary recommendations were designed in part to reduce the development of cardiometabolic danger phenotypes such as elevated blood pressure, dyslipidemia, and central adiposity by encouraging healthier eating habits, reducing consumption of added sugars, SFAs, and sodium, and choosing nutrient-dense products in all food classes. Many U.S. & UK residents eat about 2 snacks / d, adding a total of around 20–25% to the energy intake.

Evidence from respondents to the 2008–2012 UK National Diet and Nutrition Survey showed that the typical snack nutrient profile had 14 percent energy as saturated fats and 23 percent energy as sugars (predominantly added sugars), above the nutritional standard standards for the upper limits of their consumption. Snacks thus deliver a readily modifiable goal for enhancing the overall consistency of the diet. Whole nuts such as almonds consumed as snacks are recommended as part of healthier eating habits as they are abundant in protein, dietary fibre, unsaturated fatty acids, and micronutrients and may displace other snack foods that are high in SFAs, processed starch, and added sugar, and low in fiber. Inclusion of almonds in the diet is correlated with decreased risk of CVD and T2D, and higher intakes can minimize plasma LDL cholesterol and fasting blood glucose concentrations without contributing to any increase in body weight. Almond skin is a source of bioactive non-nutrients, such as (poly)phenolic compounds, that can play a role in the prevention mechanism for CVDs. Almonds also produce large quantities of L-arginine, the active vasodilator's biological counterpart, nitric oxide, and are a natural source of phytosterols that may lead to LDL cholesterol, lowering almond properties to a small degree. Yet the effect of daily intake of whole almonds on endothelial

Function, a central element in atherosclerosis in the onset, development and presentation of illness, is not yet understood. Chronic low-grade inflammation and elevated oxidative stress negatively influence the endothelial system, and are inflammatory traits linked with obesity, fatty liver and insulin resistance. Displacement of SFAs and processed carbs from traditional snack foods eaten with unsaturated fats, protein, and fiber from whole almonds in developed countries may theoretically minimize liver fat, which would ultimately influence cardiometabolic danger. This dietary intervention study (Almonds Study Targeting Dietary Intervention with Snacks, or ATTIS) was planned to evaluate the results of replacing regular everyday snacks with either whole almonds or control snacks with a nutritional profile that fits the typical UK macronutrient intake from snacks (excluding fruit) on endothelial function and liver fat, the primary outcomes.

Secondary outcomes included blood glucose, leptin, lipid profile, adipokines, fatty liver indicators, body shape, blood pressure, skeletal and pancreatic muscle weight, fecal SCFAs, serum fatty acid levels, and metabolomic levels. It was



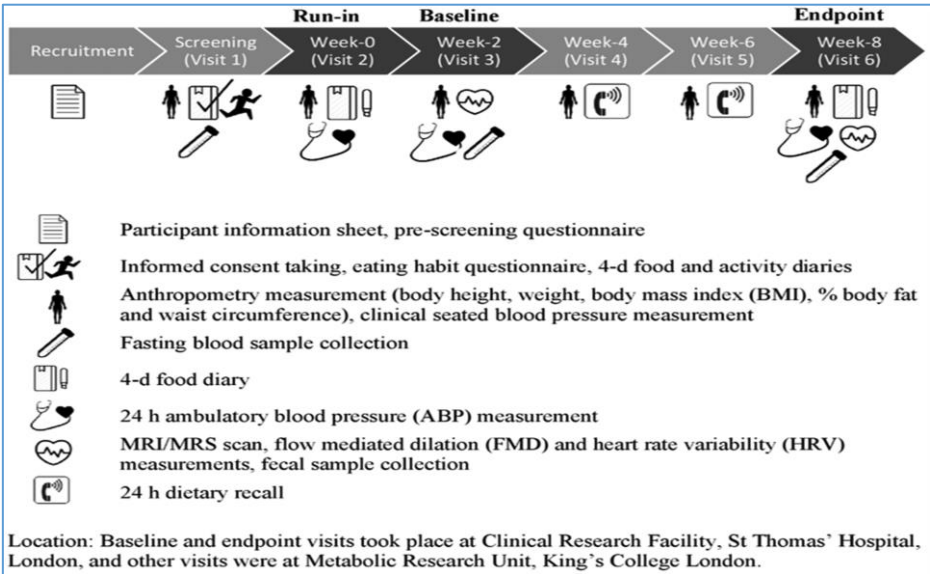
hypothesized that replacing whole almonds with typically consumed snacks would increase the vasodilatation dependent on endothelium and decrease liver fat.

METHODS

The study was a 6-wk randomized controlled, parallelarm trial. Following a 2-wk run-in period consuming control snacks (mini-muffins), participants consumed either whole roasted almonds (n=51) or control snacks (n=56), providing 20% of daily estimated energy requirements. Endothelial function (flow-mediated dilation), liver fat (MRI/magnetic resonance spectroscopy), and secondary outcomes as markers of cardiometabolic disease risk were assessed at baseline and end point.

RESULTS

Almonds, compared with control, increased endothelium dependent vasodilation (mean difference 4.1%-units of measurement; 95% CI: 2.2, 5.9), but there were no differences in liver fat between groups. Plasma LDL cholesterol concentrations decreased in the almond group relative to control (mean difference -0.25 mmol/L; 95% CI:-0.45,-0.04), but there were no group differences in triglycerides, HDL cholesterol, glucose, insulin, insulin resistance, leptin, adiponectin, resistin, liver function enzymes, fetuin-A, body composition, pancreatic fat, intramyocellular lipids, fecal SCFAs, blood pressure, or 24-h heart rate variability. However, the longphase heart rate variability parameter, very-low-frequency power, was increased during nighttime following the almond treatment compared with control (mean difference 337 ms<sup>2</sup>; 95% CI: 12, 661), indicating greater parasympathetic regulation.



Almonds Trial Targeting Dietary Intervention with Snacks (ATTIS) study design flowchart. MRS, magnetic resonance spectroscopy.

CONCLUSION



The findings of this research indicate that replacing traditional almond snacks may have a major effect on regular intakes of nutrients, which can boost endothelial activity, heart control, which lower LDL cholesterol. However, in this trial isoenergetic snack substitution did not alter regional fat deposition and therefore insulin sensitivity markers were unaffected. The degree of increase in endothelial activity and concentrations of LDL cholesterol indicates that the addition of almonds in the diet instead of commonly eaten foods has the ability to decrease the likelihood of CVD by as much as 30 per cent and may thus play an important role in increasing cardiovascular safety.

#### REFERENCE

Dikariyanto V, Smith L, Francis L, et al. Snacking on whole almonds for 6 weeks improves endothelial function and lowers LDL cholesterol but does not affect liver fat and other cardiometabolic risk factors in healthy adults: the ATTIS study, a randomized controlled trial, *The Am Jour Clini Nutr.* June 2020;111(6): 1178–1189.



This scientific input is prepared from the Department of Medical Services, an initiative of M/s Micro Labs Limited under the aegis of Micro Knowledge Academy. The information contained herein is for education purpose only. The content is developed by compiling information from various authentic and published literatures. Although great care has been taken to assure the accuracy of the publication, M/s Micro Labs Limited shall not be responsible or in any way liable for any inaccuracy, errors, or omissions resulting from negligence or otherwise howsoever or any consequences arising there from. In spite of best efforts the information in this publication may become outdated over time. M/s Micro Labs Limited shall not be responsible in any manner whatsoever, for any action taken, opinions expressed, advice rendered or accepted, any direct, incidental, special or consequential loss and damage caused on the basis of any material or information presented in this publication / update.