PRACTICAL MANUAL

Fundamental of Food Technology

Course No. HPH 216; Credits: 2(1+1)

For B. Sc. (Hons.) Horticulture 6th Semester Students

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College of Horticulture & Forestry
Rani Lakshmi Bai Central Agricultural University
Jhansi, Uttar Pradesh

Syllabus:

Date:

Methods of measuring food ingredients, effect of cooking on volume and weight, determination of percentage of edible portion. Browning reactions of fruits and vegetables. Microscopic examination of starches, estimation of energy, value proteins and fats of foods. Planning diet for various age groups.

Name of Student
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Session
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No as per the syllabus of B.Sc. (Hons.) Agriculture/ Horticulture/ Forestry semester in the yearin the respective lab/field of College.

Course Teacher

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Exercise- 1

Objective: Introduction to laboratory practices.
Laboratory Practices:
-
Instruction to work in the laboratory

Basic Record and Field Book /Lab Book
Mandatory Details Required the Basic Record

Objective: Introduction to Food Laboratory

Food		Laboratory:
Level I		
	 	 •••••
Level II		

Adulterant:	
	••••
	••••
Contaminant:	
	••••
Extraneous matter:	

Food Additive:	
- 004 / Nation - 1	
F 10.64	
Food Safety:	
Hazard:	
La constitue de	
Ingredient:	
Sample:	
•	
Unsafe food:	

	Exercise: 3
Objective: Methods of measuring food i	ngredients.
Food Ingredients:	
Materials	Required:
Procedure for measuring food ingredients:	

Results & Discussion

S.No.	Ingredients	Heaping	Leveling	Tapping
1	Green Gram			
2	Rice			
3	Wheat flour			

4	Ragi flour		
5	Ghee		

Objective: Effect of cooking on volume and weight.	
Procedure:	

	Weight increas	ed (%) = Weigh		food product			od product (g) X100
				Weight of unc	ooked food p	roduct (g)		
		Cooking loss (%) =	= Weight	of drained res	sidue in cooki	ng water (g)	_ X100	
			W	eight of uncoo	ked food prod	duct (g)		
,	Volume increas	sed (%) Volume	of cooked fo	od product (m	l) – Volume o	f uncooked fo	od product (n	nl) X100
			V	olume of unco	oked food pro	oduct (ml)		
S.	Grains	Weight before				er cooking		
No.		cooking (g)	Boi Wt.(g)	ling Vol. (ml)	Stea Wt. (g)	ming Vol. (ml)	Pressure Wt. (g)	vol. (ml)
1.	Rice ½ Cup		** (9)	V OI. (IIII)	W t. (9)	VOI. (IIII)	W t. (9)	VOI. (IIII)
2.	Macaroni							
								<u> </u>
•••••								

Objective: To determine the percentage of	f edib	le portion of	foodstuffs.	
Materials Required:				
Procedure:				
Edible portion (%) Edible po	rtion (g)	X100		
= Actual po	rtion (g)			
Observation:			NA/ - 1 .	
	S. No.	Food Stuffs	Weig Actual portion	ht (g) Edible portion
	1 2 3	Mango (Raw) Mango (Ripe) Lady's finger		
	5 6	Tomato Drumstick Carrot		
	7 8	Beans Snake Gourd		

Objective: To observe the development of enzymatic browning in vegetables and study the changes that occurs during cooking.	ł
Introduction:	
Procedure:	

Observation:				
	SI. No.	Treatments	Brinjal	Potato
		Normal water		
	2	1% sugar solution		
	1 2 3	1% salt solution		
	4	1% citric acid solution		
	5	1% KMS solution		
	5 6	1% sodium benzoate solution		
		1 /0 Socialii belizoate solution		
Precaution:				

Objective: To determine the browning reaction in fruits. **Browning** Materials Required: Procedure:

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11	bs	1	m\ 1	2	H	^	n	
u	U.S		·v	а	и	u	•	_

SI. No.	Treatments	Apple	Guava	Banana
1	Normal water			
2	1% sugar solution			
3	1% salt solution			
4	1% citric acid solution			
5	1% KMS solution			
6	1% sodium benzoate solution			
Drec	aution:			
FIEC	aution			

	To study the after cooking	e microscopic	structure	of different s	tarches	Exercis before	
Introduction	:						
Procedure:							
Observation							• • • • • • •

Objective: To find the calorific value of the	Exercise: 9
Introduction:	
introduction:	
Apparatus Required:	
Procedure:	
Initial temperature of water =.	Final temperature of water =
Heat gained by water and calorimeter =	Water equivalent of the calorimeter =
Wt. of water in the outside vessel =	Rise in temperature =
1 g sample produces = kcal	2 g sample produces = kcal

Objective: To analyse the amount of protein by Micro-Kjeldhal method.
Introduction:
Apparatus Required:
Procedure:

Nitrogen (%) =	{Sample titre-blank titre} X Nor	mality of I	HCL X 14 X Vo	ol. made up of the d	igest X100
	Aliquot of the digest take	n (ml) X W	/t. of the samp	ole taken (g) X 1000	l
	Protein (%) = N	itrogen (%)	X 6.25	
Calculation:					
Results and Di	scussion:				

Exc	ercise: 11
Objective: To find the fat value of the given food substances.	
Introduction:	
Materials Required:	
Procedure:	
Calculation:	
Oil in ground sample (%) = $\frac{\text{Weight of oil (g)}}{\text{Weight of sample (g)}} \times 100$	
Results and Discussion:	
Results and Discussion.	

					Experiment: 12
Obie	ective: Plannir	ng a diet for	infants.		•
	mmended	9 · · · · ·		Dietary	Allowance
):			<u>-</u>	
			Mean daily	Nutrient intake	
S.	Nutrionto	RD			ntake
No	Nutrients	0-6 months	6-12 months		птаке
1.	Energy (kcal)	92	80		
2.	Protein (g)	1.16	1.69		
3.	Fat (g)		19		
4.	Iron (mg)	46	5		
5.	Carotene (µg)		2800		
6.	Vitamin C (mg)	25	25		
Resu	Its and Discuss	ion:			
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	Exercise 13
Objective: Planning a diet for pre-school children.	
Introduction:	
Food Requirement:	
MEAN DAILY FOOD INTAKE	

MEAN DAILY <u>FOOD</u> INTAKE

S.	Egad Intaka (a)	RI)A	Intake
No	Food Intake (g)	1-3 year	4-6 year	
1.	Cereals and its products	175	270	
2.	Pulses and legumes	35	35	
3.	Green leafy vegetables	40	50	
4.	Roots and Tubers	10	20	
5.	Other vegetables	20	30	
6.	Fruits	100	100	
7.	Milk and Milk products	300	250	
8.	Fleshy foods	40	50	
9.	Fats and oils	15	25	
10.	Sugars	30	40	

MEAN DAILY <u>NUTRIENT</u> INTAKE

S.	Nutrients	RI	DA	Intake
No	Nutrients	1-3 year	4-6 year	
1.	Energy (kcal)	1060	1350	
2.	Protein (g)	16.7	20.1	
3.	Fat (g)	27	25	
4.	Iron (mg)	09	13	
5.	Carotene (µg)	3200	3200	
6.	Vitamin C (mg)	40	40	

Procedure:

Deculte and Discussion.	
Results and Discussion:	
	•••••

								E	xercise: 14
Ol	ojective: Planni	ng a	diet for so	chool going	child	ren.			
		_							
Fo	od Requirement:.								
	MEAN	DAILY	FOOD INTAKE			MEAN	I DAILY N	<u>iutrient</u> in	ITAKE
S.	Food Intake (g)		(10-12 years)	Intake	S.			-12 years)	Intake
No	Cereals and its products	Boys	Girls 380	intake	No 1	Nutrients Energy (kcal)	Boys 2190	Girls 2010	intake
	Pulses and legumes	45	45			Protein (g)	39.9	40.4	
	Green leafy vegetables	50	50			Fat (g)	35.9	35	
	Roots and Tubers	20	30			Iron (mg)	21	27	
	Other vegetables	50	50			Carotene (µg)	4800	4800	
	Fruits	50	50			Vitamin C (mg)		40	
	Milk and Milk products	250	250			vitamin o (mg)	70	40	
<u>'</u>	Will are will products	200	200						
D۳	a a dura i								
Pr(ocedure:								
• • • •									
• • • •									

Results and Discussion:

	Exercise: 15
Objective: Planning a diet for an adolescent boys and Introduction:	
Food Requirement:	

MEAN DAILY <u>FOOD</u> INTAKE

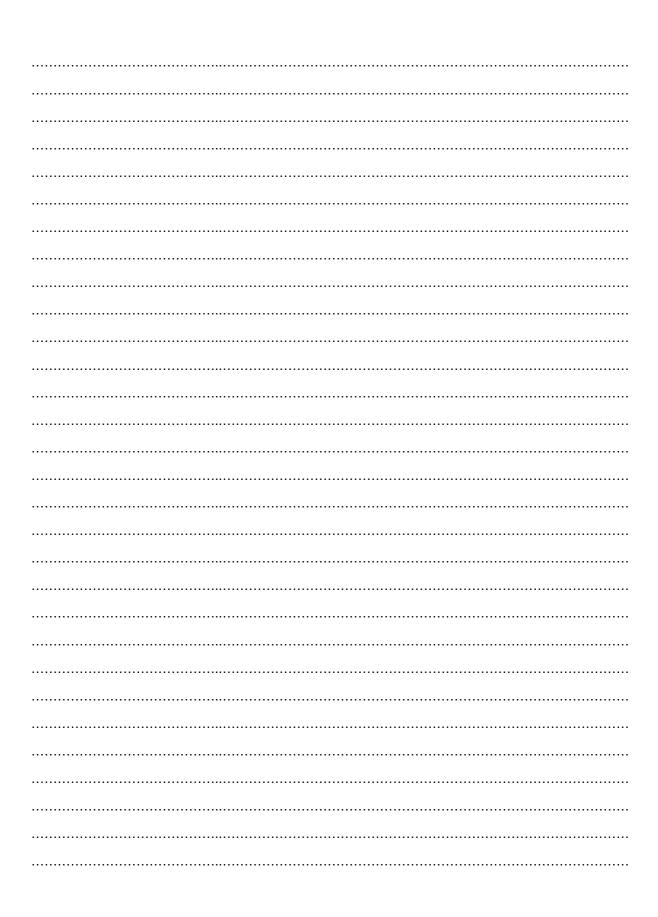
S.	Egad Intaka (a)	RI)A	Intake
No	Food Intake (g)	13-15 year	16-18 year	
1.	Cereals and its products	430	450	
2.	Pulses and legumes	70	70	
3.	Green leafy vegetables	100	100	
4.	Roots and Tubers	75	85	
5.	Other vegetables	75	85	
6.	Fruits	30	30	
7.	Milk and Milk products	250	250	
8.	Fleshy foods	30	45	
9.	Fats and oils	35	30	
10.	Sugars	30	40	

MEAN DAILY <u>NUTRIENTS</u> INTAKE

S.			RI	DA			Int	Intake		
No	Nutrients	13-15	year	16-18	year	13-15	year	r 16-18 year		
NO		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
1.	Energy (kcal)	2750	2330	3020	2440					
2.	Protein (g)	54.3	51.9	61.50	55.5					
3.	Fat (g)	45	40	50	45					
4.	Iron (mg)	32	27	28	26					
5.	Carotene (µg)	4800	4800	4800	4800					
6.	Vitamin C (mg)	40	40	40	40					

Procedure:
Results and Discussion:

L	niaatiya, Dlanni	na 4	a diat f	or odul	1 0					Exer	cise: 16	
	ojective: Planni	_										
	roduction:											
	od Requirement:.											
	MEAN D	AILY	FOOD IN	ITAKE			MEAN [DAILY	NUTRIE	<u>nts</u> intai	KE	
S. lo	Food Intake (g)		RDA Woman	In Man	take	S.	Nutrients	Man	RDA Woman		Intake	
(Cereals and its products		260	Ivian	Woman	No				Man	Woman	
F	Pulses and legumes	70	60				Energy (kcal)	2320	1900			
(Green leafy vegetables	100	100				Protein (g)	60	55			
F	Roots and Tubers	75	75				Fat (g)	25	20			
(Other vegetables	75	50				Iron (mg)	17	21			
F	ruits	60	60				Carotene (µg)	4800	4800 40			
١	Milk and Milk products	600	400			0.	Vitamin C (mg)	40	40			
	leshy foods	60	60									
	Fats and oils	35	30									
	Sugars	30	30									
L												
(ocedure:											
	sults and Discuss	sion										
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-	ective: Planning a	a diet f	or pregnant	wome	n and lacta	ting mot	ner.	
tro	duction:							
• • • •								
00	d Requirement:							
	•							
	MEAN DAILY <u>F</u>	<u>ood</u> int	AKE	MEAN DAILY <u>NUTRIENTS</u> INTAKE				
. No		RDA	Intake	S. No	Nutrients	RDA	Intake	
1.	Cereals and its products	260			Energy (kcal)	2250		
	Pulses and legumes	80			Protein (g)	82.20		
3.	Green leafy vegetables	100		3.	Fat (g)	30		
4.	Roots and Tubers	50			Iron (mg)	38		
5.	Other vegetables	75			Carotene (µg)	6400		
6.	Fruits	110			Vitamin C (mg)	60		
7.	Milk and Milk products	800						
8.	Fleshy foods	85						
9.	Fats and oils	30						
10.	Sugars	30						
roc	edure:							
• • • •								
es	ults and Discussion:							
• • • •								

Objective: Planning a diet for geriatric people.												
Introduction:												
						••						
•••						• •						
•••						• •						
						• •						
MEAN DAILY <u>FOOD</u> INTAKE												
S. No	Food Intake (g)	RDA Male Female		Male	Intake Female							
	Cereals and its products	320	220	Wale	remale	_						
	Pulses and legumes	70	55			_						
3.	Green leafy vegetables	100	125			_						
4.	Roots and Tubers	75	50									
5.	Other vegetables	75	75									
6.	Fruits	75	50									
7.	Milk and Milk products (ml)	600	600									
8.	Fats and oils	30	30									
9.	Sugars	30	30									
Pr	ocedure:											
						• •						
•••						• •						
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						• •						
						• •						
•••						• •						
Re	sults and Discussion:											
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STUDENT'S NOTE(S)