

Module 4: पोषकतत्त्वे (Nutrients)

खालील पोषक तत्त्वांची कार्ये, प्राप्ती स्थाने व अभावाचे दुष्परिणाम (Functions, dietary sources and clinical manifestations of deficiency of the following nutrients:)

4.1 कर्बोदके , स्निग्धपदार्थ व प्रथिने (Carbohydrates, Lipids and Proteins)

4.2 स्निग्धद्राव्य जीवनसत्त्वे (Fat soluble vitamins-A, D, E and K)

4.3 जल द्राव्य जीवनसत्त्वे (Water soluble vitamins Vitamin B – Thiamine, Riboflavin, and Vitamin C)

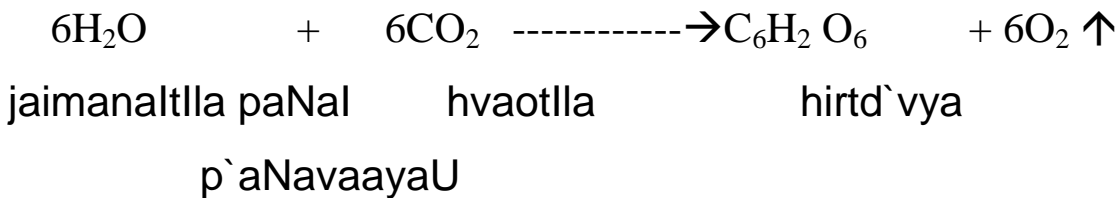
4.4 Minerals – Calcium and iron

4.1 कर्बोदके (Carbohydrates)

कार्बोहायड्रेट्स ही एक महत्त्वाची पोषक द्रव्ये आहेत. ती शरीराला ऊर्जा पुरवण्यासाठी वापरली जाते. कार्बोहायड्रेट्सचे अभावामुळे शरीराला ऊर्जा मिळत नाही. कार्बोहायड्रेट्सचे अभावामुळे शरीराला ऊर्जा मिळत नाही. कार्बोहायड्रेट्सचे अभावामुळे शरीराला ऊर्जा मिळत नाही. कार्बोहायड्रेट्सचे अभावामुळे शरीराला ऊर्जा मिळत नाही.

कार्बोहायड्रेट्सचे अभावामुळे शरीराला ऊर्जा मिळत नाही.

कार्बोहायड्रेट्सचे अभावामुळे शरीराला ऊर्जा मिळत नाही.



ही कर्बोदके मानवा वा [tr p`aiNamaa~ Aaharat Gao}ना कार्बोहायड्रेट्सचा स्रोत आहे. एक ग्रॅम कर्बोहायड्रेट्सचे 4 कॅलोरीज कार्बोहायड्रेट्सचा स्रोत आहे.

saMGaTna (Composition)

kbaao-dko mhNajao kba- va]dk (mhNajao paNal) kba-]jja va p`aNavaayaU yaaMcyaa saMyaugaanao banalaolaa saMyau@t pdaq- mhNajao kbaao-dko haoya. P`aaNavaayaU va]jjaacao p`maana inaiScat AsaUna to 1:2 Asato pNa kbaa-cao p`maana badlat Asato.

kbaao-dkacao sau~ C_6H_2 C_6 AsaUna %yaatlla kbaa-cyaa ANauMcal saM#yaa naohmal badlat Asato va tl ik%yaok hjaarapya-t AsaU Sakto.

kbaao-dkaMcao kayao- :

1. Sarlr alaa kaya-Sa@tl purivaNao ho kbaao-dkacao mah%vaacao kaya- Aaho. 1 ga`^ma kbaao-dkacyaa jvalanaapasaUna 4 Kcals]YNata imaLto. kbaao-dko svast Asalyaanao hoca kaya-Sa@tl purivaNaaro gairbaacao Anna samajalao jaato. Baartlya Aaharat ekUNa kaya-Sa@tlpOkI 65-80% kaya-Sa@tl ipYTmaya pdaqaa-cyaa sva\$pat kbaao-dkaMpasaUna imaLto.

2. kbaao-dkacaa AavaSyak p`maanaat purvaza Asalyaasa p`iqanaaMcaa]pyaaoga]YNata inamal-tlsaazl na haota Sarlr saMvaQa-naasaazl haotao. ASaap`karo kbaao-dko ek p`karo p`iqanaaMnaa %yaaMcao mau#ya kaya- krNyaasaazl madt krtat.

3. isnagQapdaqaa-caa SarlrakDUna yaaogya p`karo vaapr haoNyaasaazl %yaaMcyaa jvalanaasaazl kbaao-dkacal AavaSyakta Asato. AaharatUna yaaogya p`maanaat kbaao-

dko imaLalyaasa isnagQapdaqaa-cao jaast p`maaNaat ivaGaTna va jvalana haot naahl.

4. la^@TaojamauLo k^iISayamacyaa pcanaasa va SaaoyaNaasa madt haoto. tsaoca la^@Taoja ho kbaao-dk AatDyaat 'ba' jalvanasa%va tyaar krNaa-yaa saUxmajaMtUMnaa Anna mhNaUna AavaSyak Asato.

5. saolyaulaaojamauLo mala ivasaja-naacal ik`yaa saurLit caalato.

6. majjaasaMsqaotIla maomdu va majjaapoSal f@t glaukaoja yaa kbaao-dkacyaa sva\$pat kaya-Sa@tlcaa vaapr k\$ Saktat.tl na imaLalyaasa majjaasamsqaot kayama sva\$pacao ibaGaaD haotat. mhNaUna majjaasaMsqaocao kaya- nalT caalaNyaasaazl kmaao-dkaMcal inataMt garja Asato.

maaNasaaMmaQyao kbaao-dkacyaa kmatrtomauLo isnagQaacao ApUNa- jvalana haoto va %yaamaulo ikTaona
Classification

baa **kbaao-dkaMcal p`aPtIsqaanao**

A` vanasptl pdaq-

vanasptlmaQyao kbaao-dko Sak-ra ipYTmaya pdaq- va tMtumaya pdaq- ***ÀkaYzlr*** yaaMcyaa sva\$pat Asatat. Kalalla Annapdaqaa-t kbaao-dko p`amau#yaanao AaZLtat :

1. ekdla Qaanyao - gahU, taMdUL, jvaarl, baajarl, naacaNal, maka

2. DaLI va kDQaanyao - vaaTaNaa, maUga, tUr, hrBara, saaoyabalna yaasaarKI kDQaanyao va %yaaMcyaa DaLI va plzo.

3. Baajyaa - ivaSaoYat: kMdmauLo va KaoDo - baTaTa, rtaLo, T^ipAaoka

4. fLo - koLI, ica@kU, d`axao

5. gaaoD pdaq- - saaKr, gaUL, maQa, kakval

ba´ p`aiNaja pdaq-

kbaao-dkacao pa`iNajanya p`aPtIsqaanao mhNajao duQaatlla dugQaSak-ra. P`aaNal kbaao-dko svat:cyaa Sarlrat tyaar k\$ Sakt naahl. to kbaao-dkaMsaazi vanasptIMvar AvalaMbaUna Asatat. P`aaNyaaMcyaa Sarlrat jaast Jaalaolal kbaao-dko 'glaayakaojana' cyaa sva\$pat yakRtat saazivalal jaatat mhNaUna glaayakaojanalaa 'p`aiNaja ipYT pdaq-' mhNatat.

kbaao-dkaMcal kmatrta (Deficiency)

kbaao-dkaMcyaa kmatrtomauLo Sarlralaa kmal p`maaNaat kaya-Sa@tl imaLto. kbaao-dkaMbaraobar p`iqanao va isnagQaacaarl ABaava Asalyaasa maulaaMmaQyao marasamasa naavaaca raoga haotao. yaamauLo maulaaMcyaa baaOiQdk va maanaisak ivakasaavar pirNaama haotao va Saairirk vaaZhl KuMTto. maUla sauklyaasaarKo idsato. maaozyaa ^DIja saaztat. %yaamauLo r@t AamlaQamal-ya haoto va %yaaca pirNaama Sarlravar haotao.

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P`aiqanao (Proteins)

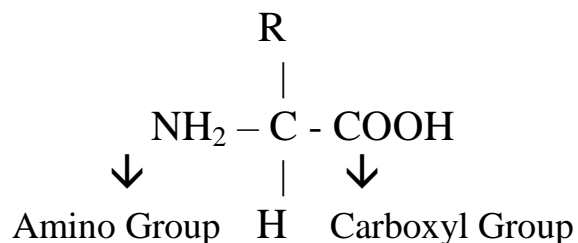
]YNata va Sa@tl p`dana krNaa-yaa GaTkap`maaNaoca Aaplyaa Sarlr alaa Sairr inamaa-Nak ASaa GaTkacal AavaSyakta Asato. Sarlratlla poSalt kbaao-dko va isnagQa pdaqaa-cyaa p`maaNaapoxaa p`iqanaaMcao p`maaNa jaast Asato. Sairr vajanaacyaa $\frac{1}{6}$ p`iqanaaMcao p`maaNa Asato va %yaatlla $\frac{1}{3}$ snaayaUt AaZLto. $\frac{1}{5}$ haDaMmaQyao tr $\frac{1}{10}$ %vacaomaQyao va]rlaolao [tr poSal va poSal d`vyaat Asato. p`iqanao hl p`aNyaacyaa va vanasptlcyaa sava- poSalt]plabQa Asatat. %yaamaulo tl Sarlr banaavaTIsaazi AavaSyak Aaho.

1938 saalal mauidr yaa Dca Saas~&anao yaa GaTkacaa SaaoQa laavalaa va %yaalaa 'p`iqanao' ho naava idlao. P`aiqanao (Proteins) yaa Sabdacal]<ap%%al Proteose yaa ga`lk SabdapasaUna Jaalal Aaho. Proteose mhNajao Holding the first place in the architect of human body. mhNajao Sarlr baaMQaNalt jyaacao maha%vaacao sqaana Aaho.

P`aiqanaaMcao saMGaTna (Composition) :

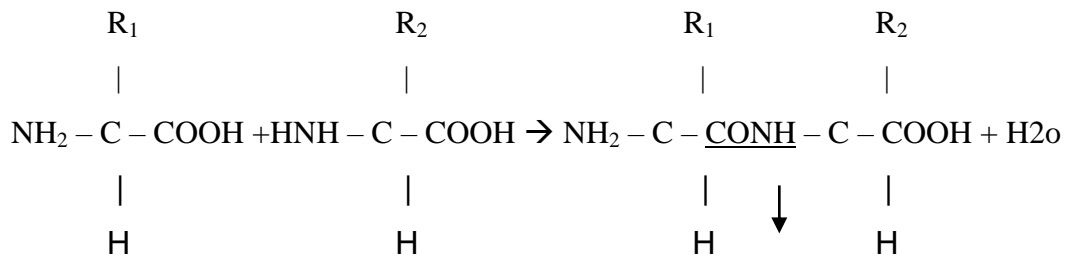
P`aiqanao hl kba- (C)]jja (H) p`aNavaayaU (O) va na~vaayaU (N) yaa GaTkapasaUna banalaolal saMyaugao Aaho. kahl p`iqanaat gaMQak fa^sfrsa laaoh AayaoDlna

taMbao va [tr GaTk Asatat. P`aiqanaaMt Asalaolyaa na~amauLo *yaaMnaa na~yau@t saMyauga (Nitrogenous Compound) Asao mhNatat. P`aiqanaamaQalla na~amauLoca %yaaMnaa ivaSaoYa sqaana p`aPt Jaalao Aaho. P`aiqanaamaQalla na~acao p`maaNa 16% to 18% Asato. p`iqanaaMcaa ANaUBaar 1300 pasaUna Anaok dSalaxaapya-Mt AsaU Saktao. %yaaMcal rcanaa i@laYT AsaUna lahana lahana maNyaacyaa maaLop`maaNaO Asato. p`iqanaaMcaa ANau tyaar krNaa-yaa lahana ANauMnaa 'it@tamlao' ikMvaa 'na~amlao' (Amino Acids) Asao mhNatat. ekUNa 22 p`karcao it@tamlao Aahot. P`a%yaok it@tamlaaaQyao ek AlkQamal-ya gaT (-NH₂) Aimanaao AaiNa ek AamlaQamal-ya gaT (-COOH) kabaaO-@Jalla gaT Asatao. it@tamlaacal rcanaa puZlla p`maaNaO Aaho:



it@tamlacyaa eka ANaUt - COOH ha AamlaQamal-ya gaT va - NH₂ ha AlkQamal-ya gaT Asalyaanao p`iqanaaMnaa ivdBaarlit saMyaugao mhNatat. it@tamlao ekmaokalaa ivaiSaYT baMQaanao jaaoDlal jaatat. yaa baMQaalaa 'poPTa[-D baMQa' mhNatat. ha baMQa tyaar haotanaa eka na~amlaacaa kabaaO-i@sala gaT ha dusa-yaa na~amlaacaa Aimanaao gaTaSal saMyau@t haotao. yaa p`ik`yaot

paNyaacaa ek roNaU vaogaLa haotao. hl ik`yaa Kalallap`maaNaO GaDto:



poPpa[-D baMQa

P`aiqanaacaa roNaU tyaar haotanaa ASal Anaok na~amlao ek~ baaMQalaa jaa}na saaKLI tyaar haoto yaasa 'poPTa[-D SaRMKlaa' Asao mhNatat.

Aaharatlla p`iqanaat 22 p`karcil it@tamlao Asatat. P`a%yaok p`iqanaaMcao gauNaQama- %yaatlla it@tamlavar daona p`kar Aahot.

1. AavaSyak it@tamlao Essential Amino Acids – jal it@tamlao AavaSyak %yaa p`maaNaat Sarlrat tyaar krta yaot naahlit va mhNaUna tl AaharatUna purvaaval laagatat ASaa it@tamlanaa 'AavaSyak it@tamlao' mhNatat. AavaSyak it@tamlao ekUNa dha Aahot.

- | | |
|----------------------------------|-------------------------|
| 1. AayasaalyaUisana (Isoleucine) | 6. iTPTaof^na |
| (Tryptophan) | |
| 2. Iyauisana (Leucine) | 7. vh^liana (Valine) |
| 3. laayaisana (Lysine) | 8. ifnaa[-la A^la^naa[- |
| na (Phenyl Alanine) | |
| 4. imaiqaAaonaa[-na (Methionine) | 9. Aaija-inana |
| (Arginine) | |

5. iqa`Aaonaa[-na (Threonine)
(Histidine)

10. ihisTDIna

hl sava- AavaSyak it@talao AaharatUna eka zraivak p`maaNaat iaLalao trca Sarlracal vaaZ yaaogya t-honao hao} Sakto.

2. AnaavaSyak it@tamlao (Non –essential Amino Acids) –

AnaavaSyak it@tamlao mhNajao hl 'tyaar' sva\$pat AaharatUna purivaNao AavaSyak nasalao. jar Sarlrallaa AaharatUna AavaSyak it@tamlaaMcaa purvaza haot Asaola tr %yaapasaUna Sarlr garjaonusaar 'AnaavaSyak it@tamlao' tyaar k\$ Sakto. ASaa t-honao Sarlracyaa garjaocyaa p`maaNaat AnaavaSyak it@tamlao Sarlrat inamaa-Na haotat mhNaUnaca %yaaMnaa AaharatUna purivaNyaacyaa dRiYTaonaatUna Aaharat 'AnaavaSyak it@tamlao' Asao saMbaaoiQalao jaato. Sarlratlla %yaaMcyaa kayaa-cyaa dRYTInao tl AavaSyak it@tamlaa [tklca mah%vaacal Aahot.

jal it@tamlao Sarlrat AavaSyak %yaa p`maaNaat tyaar kolal jaatat va mhNaUna %yaaMcaa AaharatUna Sarlrallaa purvaza kravaa laagat naahl %yaaMnaa AnaavaSyak it@tamlao mhNatat. hl it@tamlao Kalalla p`maaNaao Aahot.

1. A^la^inana (Alanine)

7. glaayasalna (Glycine)

2. A^spariTk Aamla (Aspartic Acid)
(Glutamic Acid)

8. glauT^imak A^isaD

- | | |
|--------------------------------|------------------------------|
| 3. isasTlna (Cystine) | 9. hayaD/ao@sal glauT^imak |
| A^isaD (Hydroxy Glutamic Acid) | |
| 4. isasTo[na (Cysteine) | 10. hayaD/ao@sal |
| p`aolalna (Hydroxy Proline) | |
| 5. p`aolalna (Proline) | 11. Tayaraosalna (Tyrosine) |
| 6. isarlina (Serine) | 12. Aa^ina-iqana (Ornithine) |

P`aiqanaaMcal p`aPtIsqaanao (Sources of Proteins) :

A´ vanasptlja pdaqa-

1. kDQaanyao - hrBara maUga masaUr rajamaa saaoyaabalna tUr]Did
2. DaLI - hrBara DaL maUgaDaL]iDd DaL [. DaLI va DaLIcao plz
3. kzINa kvacaacal fLo - SaoMgadaNao kajaU tIL karLo javasa Ak`aoD badama [tr tolaibayaa

ba´ p`aiNaja pdaqa-

1. dUQa va dUQaacao pdaqa- - dUQa dhl pnalr Kvaa ca@ka calja dUQa pavaDr
2. AMDI
3. maasao maaMsa KaVpxal

P`aiqanaaMcal kayao- (Functions of Proteins) :

1. Sarlracal vaaZ krNao - Sarlrat naivana poSal tyar krNao ho p`iqanaaMcao p`mauK kaya- Aaho. lahana maulaaMcyaa

vaaZIsaazi A%yaMt AavaSyak Aaho. lahana maulaaMcyaa
vaaZIsaazi A%yaMt AavaSyak Aaho. ivakasaacyaa Avasqaot
baalyaavasqaa ikSaaoravasqaa tsaoca gaBaa-vasqaot
p`iqanao A%yaMt AavaSyak Asatat.

2. poSaIMcal Jalja Ba\$na kaZNyaasaazi p`iqanaaMcal
AavaSyakta Asato.

3. pacak d`vyaaMcyaa inaima-tlsaazi p`iqanao madt krtat.

4. r@tatlla laalapNaa va ihmaaoglaaobalna banaivaNyaasa va
p`aNavaayau SaaYaNyaasa p`iqanao madt krtat.

5. Sarlratlla snaayaU inarinaraLo Avayava Amt:s~aval ga`Mqal
maaMsala Baaga Aisqa %vacaa dat kosa naKo [. cyaa inaima-
tlsaazi p`iqanaaMcal AavaSyakta Asato.

6. AMt:s~aval ga`Mqalt inamaa-Na haoNaa-yaa hamao-
nsasaazi AavaSyak]da. qaayaroo@salna [nsaulalna

7. Sa@tl]%padna -Sairracyaa AavaSyaktopoxaa jaast
p`maaNaat Gaotlaolal p`iqanao isnagQa pdaqaa-cyaa sva\$pat
\$paMtr haotat AaiNa saazivalal jaatat. Aaharat jaovha kbaao-
dko va isnagQa pdaqaa- kmal haotat. tovhaca p`iqanao kaya-
Sa@tl purivatat. ho p`iqanaaMcao duyyama kaya- Aaho. ek
ga`^ma p`iqanaaMpasaUna 4 Kcals]YNata imaLto.

8. Sarlracal raoga p`itkaSa@tl inamaa-Na krNyaat mhNajaoca
Sarlrat p`itd`vyao tyaar haoNyaat p`iqanao AavaSyak.

9. jaKmaa Ba\$na kaZNyaat tsaoca r@t gaaozNyaacyaa
ik`yaolaa p`iqanao AavaSyak.

10. p`iqanaaMcyaa Aist%vaanao r@t jaast Aamlalya Aqavaa Alkinaya haot naahl.

11. Sarlratlla Gaama maU~ [%yaadl dvaaro na~vaayaU ha yaoiryaa va yauirk A^isaDcyaa sva\$pat baahor Taklaa jaatao. ha vaayaU Ba\$na kaZNyaasa p`iqanaaMcal AavaSyakta Asato.

12. poSalMcyaa cayaapcayaasaazi p`iqanao AavaSyak

13. Sarlratlla snaayaU va Avayava saudRZ krNyaacao kaya-p`iqanao krtat.

p`iqanaaMcyaa ABaavaacao duYPairNaama (Deficiency Disorders)

baalakaMcyaa p`iqanaaMcyaa kmatrtonao haoNaara raoga mhNajao @vaaSalAa^rkr haoya. yaa raogaat Kalalla laxaNao idsatat.

1. baalakacao vajana GaTto.]Mcalt vaaZ haot naahl

2. poSalt paNal saacato %yaamauLo Sarlravar saUja yaoto. savaa-t p`qama payaavar saUja yaoto AaiNa naMtr saMpUNa-Sarlravar saUja yaoto. caoh-yaavarlla saUjalmauLo caohra pUNa- caMd`cyaa AakRtlp`maaNao gaaola haotao. mhNaUna gaaola caMd`acal]pmaa idlal jaato.

3. kosaacaa rMga badlatao. itrMgal Qvajaap`maaNao kosa idsatat. Kosa KrKrlt laala rMgaacao va izsaUL haotat. Dao@yaava\$na nausata hat ifrivalyaasa kosaaMcaa puMjaka hatat yaotao. Kosa AaoZlao trl vaodnaa haot naahl. kosaaMcaa rMga laalasar tpikrl va paMZra haot jaatao. ekaca

kosaavar kaLa laala paMZra Asao rMga idsatat mhNaUna itrMgal kosa yaa raogaacao laxaNa Aaho.

4. gaBaa-vasqaot va gaBaa-vasqaonaMtr puroSal p`iqanao na imaLalyaasa maulaacyaa Saarlirk ivakasaabaraobar baaOiQdk maanaisak va Baavainak ivakasa KuMTIaolaa idsatao. Asao maUla AaplyaaBaaovatl kaya caalalao Aaho yaabaabat]daisana idsato. %yaalaa Anna KoLNal yaacao AakYa-Na nasato mhNaUnaca ']daisanata' ho p`iqanaaMcyaa kmatrtocao mau#ya karNa Aaho.

5. %vaca inastoja idsato. %vacaovar purL yaotao. %vacaolaa icara jaatat. jaKmaa haotat icaGaLtat. maulaaMcao gala laala va saujalaolao idsatat. %vacaovar laala kaLo Daga pDtat.

6. p`iqanaaMcyaa kmatrtonao raogap`itkar Sai@t kmal haoto. %yaamauLo saaMsaiga-k raoga caTkna haotat. varcaovar taoMD yaoto.

7. maUla ASa@t idsato va icaDicaDo haoto.

8. yakRtat ibaGaaD Jaalyaanao ASaa maulaacao yakRt maazo Jaalaolao idsato. %yaamauLo nagaara Jaalaolaa idsatao.

P`aaOZ vya@tlmaQyao p`iqanaaMcyaa kmatrtocal laxaNao kmal AaZLtat. yaacao mau#ya karNa p`aOZ vyaat Sarlracal vaaZ haot naahl. jaovha ABaava haotao tovha vya@tlcao vajana kmal haoto. r@taxar haotao. patL saMDasa sau\$ haoto. kama krtanaa lavakr qakvaa yaotao. AMgaavar saUja yaoto. jaKmaa Jaalyaasa lavakr Ba\$na yaot naahl.

P`aiqanao va k^laircyaa ABaavaanao marasma (Marasmus) raoga haotao.

isnagQapdaqaa- (Lipids)

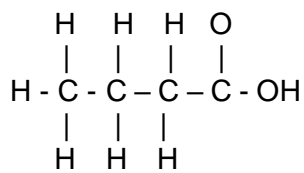
vanasptlja va p`aiNaja KaVpdaqaa-t jaao icakT va tolakT Baaga AaZLtao %yaasa isnagQapdaqaa- Asao mhNatat. }jaa-]%pna krNaa-yaa GaTkat isnagQapdaqaa-cao samaavaoSa haotao. isnagQaacyaa 1 ga`^ma jvalanaapasaUna 9 iklaaok^larl]YNata imaLto. isnagQapdaqaa- paNyaat Aivad`avya Asatat. Inasagaa-t isnagQapdaqaa- mau@t sva\$pat AaZLtao naahl. vanasptlcyaa va p`aNyaacyaa ivaiSaYT isnagQayau@t poSalmaQyao isnagQapdaqaa- AaZLtat.

saMGaTna (Composition) :

isnagQapdaqaa- ho kaba-na hayaD/aojana va p`aNavaayaU yaaMcyaa saMyaugaanao banalaolao saMyau@t pdaqaa- haoya. *yaat kbaao-dkapoxaa kaba-na va hayaD/aojanacao p`maana jaast va Aa^@saljanacao p`maana kmal Asato. %yaamaulo kbaao-dkapoxaa isnagQapdaqaa-pasaUna jaast kaya-Sa@tlcaa purvaza haotao.

isnagQapdaqaa- mhNajao iglasara^la va isnagQaamlaacao [sTsa- Asatat. iglasara^la *yaa AlkaohaolamaQyao tlna hayaD/aoi@sala gaT Asatat. isnagQamlaacao saU~ -COOH

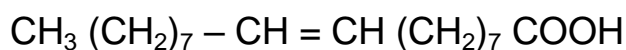
]da. laaNyaatlla byauTik Aamla pamatolaatlla paimaTik Aamla Kaobarola tolaatlla isTAirk Aamla.



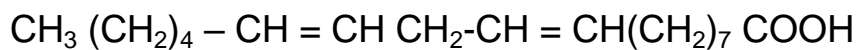
saMpR@t isnagQaamlaatlla saaKLI

2. AsaMpR@t isnagQaamlao (Unsaturated Fatty Acids)

yaatlla hayaD/aokaba-nacal saaKLI hayaD/aojananao saMpR@t Jaalaolal nasato %yaamaulo yaat ek Aqavaa Anaok duhorl baMQa Asatat. ek duhorl baMQa Asalyaasa ekivaQa AsaMpR@t isnagQaamlao va Anaok duhorl baMQa Asalyaasa isnagQaamlao mhNatat.



AsaMpR@t isnagQaamlao – Aa^lao[k Aamla



bahuivaQa AsaMpR@t isnagQaamlao 3ilanaaolao[k Aamla´

isnagQapdaqaa-t saMpR@t isnagQaamlaacao p`maana jaast Asalyaasa tao Gana sva\$pat Asatao tr AsaMpR@t isnagQaamlao jaast p`maanaat Asalyaasa tao d`va sva\$pat Asatao. kahl bahuAsaMpR@t isnagQaamlaonaa `AavaSyak isnagQaamla´ mhNatat. karNa tl AaharatUnaca prvaaval laagatat. va hl isnagQaamlao Sarlracal vaaZ va Jalja Ba\$na kaZtat va %vacaosaazl AavaSyak Asatat. ilanaaoilak Aamla va ilanaaolaoinak Aamla hl AavaSyak isnagQaamlao Aahot. Aaik-Daoinak Aamla doiKla AavaSyak isnagQaamla Aahot.

isnagQaacal kayao- (Functions of Fats):

1. Sairralaa]YNata va Sa@tl inamaa-Na krNyaasa isnagQapdaqaa-cal AavaSyakta Asato. 1 ga`^ma isnagQapdaqaa-cyaa jvalanaapasaUna 9 iklaok^larl]YNata imaLto. mhNajao kbaao-dkacyaa va p`iqanaacyaa javaL javaL duPpT kaya-Sa@tl isnagQaapasaUna imaLto.
2. Sarlravar ivaSaoYat: %vacaoKalal carbal saazivalal jaato. Va ADcaNalcyaa vaoLI]YNata va Sa@tl inamaa-Na krNyaasaazi]pyaaoga haotao.]da. AjaarpNa]pasamaar [.
3. SarlraBaaovatI Asalaolyaa carbalcyaa AavarNaamauLo SarlratIla]YNata sahjaasahjal baahor jaa} Sakt naahl.
4. naajaUk [i`d`yaaBaaovatI isnagQapdaqaa-cao AavarNa Asato. %yaamauLo tl jaagacyaa jaagal rahtat va %yaaMcao saMrxaNa haoto.]da. maU~ipMD DaoLo yakRt)dya majjatMtU carbalcao AavarNa Asalyaanao *yaa [Mid`yaaMnaa sahsaa [jaa haot naahl.
5. Sarlralaa carbalmauLo Aakar p`aPt haotao va Sarlr saaOYzva vaaZto.
6. carbalmauLo %vaca maulaayama rahto.
7. kbaao-dkaMcao pcana haoNyaasa madt haoto.
8. jalvanasa%va A D [ko isnagQad`avya Asalyaanao isnagQapdaqaa-cyaa Aist%vaat *yaa jalvanasa%vaaMcao SaaoyaNa hao} Sakto.
9. isnagQapdaqaa-mauLo Aaharalaa }Mcal p`aPt haoto. isnagQapdaqaa-cyaa saovanaanao tRPtl haoto AaiNa Kalalyaacao samaaQaana vaaTto.

10. isnagQapdaqaa-caa Sarlrat vaMgaNaasaarKa]pyaaoga haotao.

11. isnagQapdaqaa- va kbaao-dkaMcaa puroSal]YNata va Sa@tl inamaa-Na krNyaasaazi]pyaaoga Jaalaa tr p`iqanaaMcaa naivana poSal inamaa-Na krNyaasaazi]pyaaoga kolaa jaatao.

12. yaatUna 'AavaSyak isnagQaamlaacaa' purvaza haotao.

isnagQapdaqaa-ची **P`aaPtIsqaanao (Sources) :**

P`aaNalja va vanasptlja pdaqaa-tUna isnagQapdaqaa- imaLU Saktat.

P`aaNalja isnagQapdaqaa-

1' duQa va duQaacao pdaqaa- - saaya ik`ma laaoNal tUp dhl Kvaa ca@ka pnalr

2' AMDI - ivaSaoYat: ipvaLa balak

3' p`aNyaacal carbal va %yaapasaUna tyaar kolaolao maagaa-TIna va maaSaacal tolao]da. Saak- ilavhr Aa^[-la ka^D ilavhr Aa^[-la.

vanasptlja isnagQapdaqaa-

1' sava- p`karcacal vanasptlja tolao va tola ibayaa

2' kzINa kvacaacal fLo - badama SaoMgadaNao kajaU Ak`aoD naarL tIL maaohrl

isnagQapdaqaa-cyaa ABaavaacao duYpirNaama (Effects of Deficiency) -

isnagQapdaqaa-cyaa ABaavaamauLo duYpirNaama
 tabaDtaoba Jaalaolao idsat naahl. jar Aaharat baroca
 idvasapyaa-Mt isnagQapdaqaa- nasatlla tr Kalalla duYpirNaama
 idsaUna yaotat.

1' isnagQapdaqaa-cyaa kmatrtonao isnagQaamlaacal kmatrta
 haoto %yaamauLo Sarlracal vaaZ kmal haoto. vajana kmal
 haoto.

2' %vacaacaa kaorDI pDto KrKrlt haoto. isnagQamlaacyaa
 ABaavaamauLo if`naaoDmaa- (Phrynoderma) ha %vacaocaa
 raoga haotao.

3' isnagQapdaqaa- kmal imaLalyaasa jalvanasa%va A,,₃ D₃ [-₃
 va ko mauLo haoNaaro duYpirNaama idsaUna yaotat.

4' Saarlrk va maanaisak kama krNyaacal sfutl- raht naahl.

5' kahl ivakaraMcyaa p`ik`yaot AsaMtuilat yaoto.

