SUPERFOOD

POTENSI IKAN SALUANG DAN KACANG NAGARA

SEBAGAI NUTRISI OTAK

HAITAMI | TRIAWANTI
ROSELINA PANGHIYANGANI
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PRAKATA

Puji syukur ke hadirat Allah SWT atas segala limpahan rahmat dan karunia-Nya, sehingga penulis dapat menyelesaikan buku referensi ini yang berjudul *"SUPERFOOD: Potensi Ikan Saluang dan Kacang Nagara Sebagai Nutrisi Otak"*. Buku ini merupakan hasil refleksi ilmiah dari serangkaian kajian literatur yang mendalam serta dedikasi dalam menjawab tantangan ilmiah dan sosial di bidang gizi dan kesehatan otak. Semoga buku ini dapat menjadi sumbangsih nyata dalam upaya peningkatan kualitas pendidikan dan kesehatan, khususnya yang berakar pada potensi pangan lokal Indonesia.

Buku ini membahas secara komprehensif mengenai dua komoditas pangan lokal, yakni ikan saluang (*Rasbora spp.*) dan kacang nagara (*Vigna unguiculata* spp. *Cylindrica*), yang memiliki potensi luar biasa sebagai *superfood* untuk mendukung fungsi dan kesehatan otak. Ikan saluang dikenal kaya akan protein dan asam amino esensial seperti lisin dan metionin, sedangkan kacang nagara mengandung senyawa bioaktif penting serta serat dan mikronutrien yang mendukung neuroplastisitas. Keduanya menawarkan solusi berbasis sumber daya lokal dalam meningkatkan asupan nutrisi esensial yang mendukung perkembangan dan pemeliharaan fungsi kognitif.

Masalah malnutrisi, khususnya kekurangan protein, masih menjadi tantangan besar di berbagai belahan dunia. Data epidemiologis global menunjukkan bahwa lebih dari 148 juta anak mengalami stunting dan 45 juta lainnya mengalami wasting (UNICEF, 2023). Di Indonesia, prevalensi stunting mencapai 21,6% pada tahun 2022, dan daerah-daerah seperti Kalimantan Selatan masih menunjukkan angka yang memprihatinkan. Malnutrisi berdampak bukan hanya pada pertumbuhan fisik, tetapi juga perkembangan kognitif, fungsi kekebalan, dan produktivitas jangka panjang. Oleh karena itu, eksplorasi sumber gizi berbasis lokal seperti ikan saluang dan kacang nagara menjadi langkah strategis yang mendesak untuk mendukung ketahanan gizi dan kesehatan masyarakat.

Penulis berharap buku ini dapat memberikan manfaat yang luas bagi mahasiswa, dosen, peneliti, tenaga kesehatan, maupun masyarakat umum yang memiliki perhatian terhadap gizi, kesehatan otak, dan ketahanan pangan lokal. Selain sebagai referensi akademik, buku ini juga diharapkan dapat menjadi dasar pemikiran dalam pengembangan program intervensi gizi berbasis bahan pangan lokal, serta inspirasi untuk menggali potensi kekayaan alam Indonesia yang masih belum sepenuhnya dimanfaatkan secara optimal.

Ucapan terima kasih yang tulus penulis sampaikan kepada kedua orang tua tercinta, keluarga besar, dan para pembimbing yang telah memberikan dukungan moral dan intelektual yang tiada henti. Terima kasih juga kepada Kementerian Kesehatan Republik Indonesia atas kepercayaan dan dukungan pembiayaan tugas belajar penulis. Penghargaan yang sebesar-besarnya juga penulis sampaikan kepada seluruh pihak yang telah membantu, baik secara langsung maupun tidak langsung, dalam proses penulisan dan penyusunan buku ini.

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BAB 1
PENDAHULUAN

A. Permasalahan Gizi Kurang

Malnutrisi protein merupakan masalah kesehatan global yang memberikan dampak serius terhadap pertumbuhan fisik, perkembangan kognitif, serta kualitas hidup individu, khususnya pada anak-anak (Soliman *et al.,* 2021). Berdasarkan data yang dirilis oleh UNICEF, WHO, dan World Bank Group pada tahun 2023, sekitar 148,1 juta anak di bawah usia lima tahun mengalami stunting, sementara 45 juta anak lainnya menderita wasting (UNICEF, 2023). Kondisi tersebut tidak hanya memperburuk kesehatan anak secara umum, tetapi juga meningkatkan risiko kematian dini (Smith *et al.,* 2020). Anak-anak yang mengalami malnutrisi protein cenderung memiliki sistem kekebalan tubuh yang lemah, sehingga mereka lebih rentan terhadap infeksi dan penyakit yang berulang. Malnutrisi dapat mengganggu fungsi pelindung epitel tubuh, seperti pada kulit dan mukosa usus, yang berperan sebagai garis pertahanan pertama terhadap berbagai patogen. Pada anak-anak yang mengalami malnutrisi, fungsi pelindung fisik tersebut menjadi melemah, sehingga memudahkan patogen untuk masuk dan menyebabkan infeksi (Rytter *et al.,* 2014).

Selain itu, malnutrisi dapat menyebabkan keterlambatan perkembangan kognitif yang signifikan, sehingga berdampak negatif pada kemampuan belajar dan produktivitas individu di masa depan. Anak-anak yang mengalami malnutrisi cenderung menghadapi tantangan besar dalam pencapaian akademik mereka. Kondisi ini tidak hanya memengaruhi hasil pendidikan, tetapi juga memberikan implikasi jangka panjang terhadap kesempatan ekonomi di masa dewasa. Rendahnya prestasi akademik yang diakibatkan oleh asupan gizi yang tidak optimal dapat menghambat peluang untuk memperoleh pekerjaan yang layak, yang pada akhirnya berdampak pada penurunan pendapatan. Dengan demikian, siklus kemiskinan berpotensi terus berulang, di mana keterbatasan ekonomi semakin diperparah oleh rendahnya kualitas pendidikan. Oleh karena itu, penting untuk memahami bahwa intervensi gizi sejak usia dini memiliki dampak yang luas, baik secara pendidikan maupun ekonomi, bagi masa depan individu (Soliman *et al.,* 2021). Selain itu, penelitian juga menunjukkan bahwa dampak malnutrisi tidak hanya terbatas pada generasi saat ini, melainkan dapat diteruskan ke generasi berikutnya. Ibu yang mengalami malnutrisi selama masa kehamilan cenderung melahirkan bayi dengan berat badan lahir rendah, yang pada gilirannya meningkatkan risiko bayi tersebut mengalami malnutrisi (Titaley *et al.,* 2019; Marshall *et al.,* 2022).

Malnutrisi merupakan masalah kesehatan yang memiliki prevalensi tinggi dan memberikan dampak signifikan pada berbagai organ tubuh, sehingga dapat menyebabkan gangguan kesehatan yang serius. Kekurangan gizi, baik berupa makronutrien seperti karbohidrat, protein, dan lemak, maupun mikronutrien seperti vitamin dan mineral, tidak hanya menghambat pertumbuhan fisik, tetapi juga mengganggu fungsi fisiologis organ-organ penting seperti jantung, ginjal, hati, serta terutama otak (Dispasquale, 2020; Ahmed *et al.,* 2022; Muller & Krawinkel, 2005).

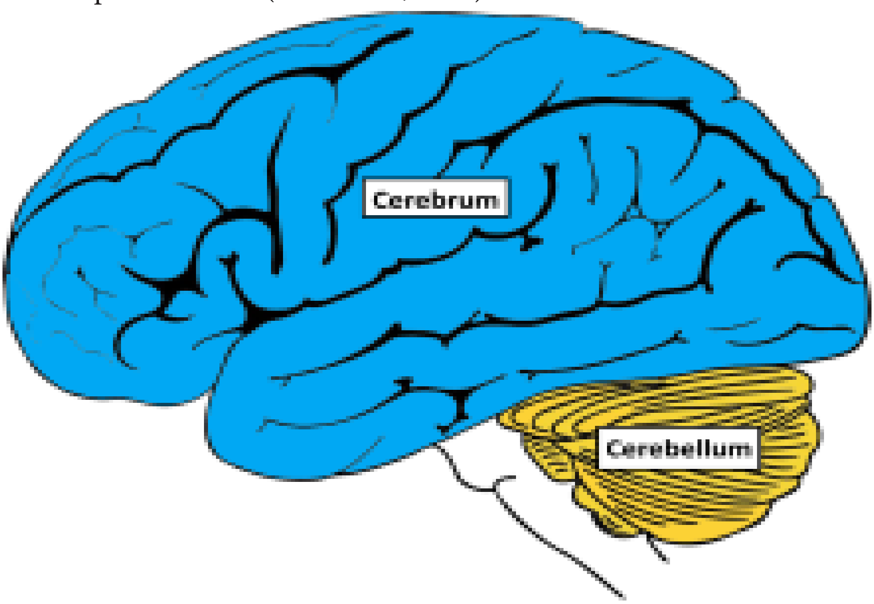
BAB 2
ANATOMI DAN FISIOLOGI OTAK

A. Struktur Makroskopis Otak

Otak merupakan organ yang sangat kompleks dan memiliki peran sentral dalam mengendalikan berbagai fungsi tubuh, termasuk pikiran, ingatan, emosi, sentuhan, keterampilan motorik, penglihatan, pernapasan, pengaturan suhu, rasa lapar, serta hampir setiap proses vital yang menjaga keseimbangan tubuh kita (Doeschka, 2022). Otak bersama dengan sumsum tulang belakang yang memanjang dari pangkalnya, membentuk sistem saraf pusat (SSP), yang berfungsi sebagai pusat pengendali dan pengatur semua aktivitas saraf di seluruh tubuh (Peabody & Black, 2023). Dengan berat sekitar 3 pon (1,4 kg) pada rata-rata orang dewasa, otak terdiri dari sekitar 60% lemak, menjadikannya salah satu organ tubuh dengan kandungan lemak tertinggi. Sisanya, yaitu 40%, merupakan kombinasi dari air, protein, karbohidrat, dan garam, yang semuanya penting untuk mendukung fungsi dan struktur otak (Peabody & Black, 2023).

Otak terdiri dari jaringan saraf yang rumit, termasuk pembuluh darah yang memasok oksigen dan nutrisi penting, serta jaringan saraf yang mencakup miliaran neuron dan sel glia (Lei *et al.*, 2017). Neuron adalah sel yang bertanggung jawab untuk mengirimkan sinyal listrik dan kimia ke seluruh tubuh, sementara sel glia berfungsi untuk mendukung dan melindungi neuron, serta memainkan peran penting dalam menjaga kesehatan jaringan saraf (Rahman *et al.*, 2022).

Otak manusia memiliki berbagai struktur kompleks, masing-masing berperan khusus dalam mengatur fungsi tubuh dan pikiran. Di antara bagian utamanya, *cerebrum* dan *cerebellum* berperan penting dalam mendukung aktivitas kognitif dan koordinasi motorik, menjadikannya pusat kendali utama berpikir dan bergerak. Meski keduanya vital, cerebrum dan cerebellum memiliki fungsi dan kontribusi yang berbeda terhadap sistem saraf (Kanwisher, 2010).



Gambar 2.1. Serebrum dan Serebelum Otak (Lorimer, 2020).

Sereberum adalah bagian terbesar dari otak manusia, mengisi sebagian besar rongga kranial. Terdiri dari dua belahan (hemisfer kiri dan kanan), serebrum bertanggung jawab atas fungsi-fungsi kognitif yang lebih tinggi,

BAB 3

DAMPAK KEKURANGAN NUTRISI PADA OTAK DAN ORGAN TUBUH

A. Dampak Kekurangan Nutrisi Pada Otak

Kekurangan protein selama masa perkembangan kritis, terutama pada periode perinatal, dapat menyebabkan penurunan ketebalan pada berbagai area otak seperti korteks visual, neokorteks parietal, dan hippocampus. Hal ini menyebabkan penurunan jumlah neuron, gangguan pada percabangan dendrit, serta penurunan jumlah sinapsis yang menghubungkan antar-neuron. Pada gilirannya, perubahan struktural ini dapat memengaruhi fungsi kognitif dan perilaku secara signifikan. Pengaruh Kekurangan Protein terhadap neuroanatomi dapat dijelaskan sebagai berikut (Chertoff, 2015).

Perkembangan Otak dan Nutrisi: Perkembangan otak adalah proses yang kompleks, di mana pembelahan sel, diferensiasi, migrasi, dan konektivitas berlangsung secara bertahap. Proses ini sangat dipengaruhi oleh faktor eksternal, seperti nutrisi. Protein berperan penting dalam penyusunan struktur otak, terutama karena protein adalah komponen esensial dari sel dan neurotransmitter. Kekurangan protein selama masa pertumbuhan prenatal dan postnatal dapat menyebabkan gangguan pada perkembangan otak, yang berdampak pada ukuran, struktur, dan fungsi otak (Kadosh *et al,* 2021).

Efek Malnutrisi Protein pada Ketebalan Korteks dan Hipokampus: Penelitian pada hewan coba menunjukkan bahwa kekurangan protein secara signifikan mengurangi ketebalan korteks visual, neokorteks parietal, dan struktur penting seperti hippocampus, khususnya daerah CA3 dan gyrus dentatus (*dentate gyrus*). Area-area ini penting dalam proses kognitif dan memori, sehingga malnutrisi protein yang menghambat perkembangan struktur-struktur ini dapat berdampak negatif pada fungsi kognitif (Chertoff, 2015).

Perubahan Neuroanatomis yang Spesifik Berdasarkan Gender: Selain itu, penelitian pada hewan coba tikus menunjukkan adanya perubahan spesifik gender dalam perkembangan otak akibat malnutrisi protein. Pada *cerebellum* (otak kecil), misalnya, malnutrisi protein menunjukkan pengurangan lebih besar pada ukuran *cerebellum* pada hewan coba tikus betina dibandingkan jantan. *Cerebellum* bertanggung jawab atas koordinasi motorik, dan dampak malnutrisi ini menyebabkan gangguan perkembangan pada lapisan granular, molekuler, dan mielinasi, yang pada akhirnya mengganggu fungsi motorik (Chertoff, 2015).

Penurunan Proliferasi Sel dan Kompleksitas Dendrit: Penelitian juga menunjukkan bahwa malnutrisi protein pada periode prenatal dan postnatal menurunkan proliferasi sel di zona subgranular (SGZ) otak serta mengurangi kompleksitas arborisasi dendrit. Dendrit adalah bagian dari neuron yang memainkan peran penting dalam pengolahan informasi sinaptik. Penurunan panjang dan jumlah dendrit ditemukan di korteks dan hippocampus, yang dapat menyebabkan gangguan pada konektivitas neuronal dan fungsi otak (Ranade *et al,* 2012).

BAB 4

PATOMEKANISME GANGGUAN FUNGSI OTAK AKIBAT KEKURANGAN PROTEIN

A. Protein dan Kesehatan Otak

Protein memainkan peran sentral dalam mendukung kesehatan dan fungsi otak, tidak hanya sebagai penyedia asam amino esensial yang penting bagi sintesis berbagai neurotransmiter seperti dopamin, serotonin, dan glutamat, tetapi juga dalam menjaga integritas struktural jaringan saraf. Neurotransmiter tersebut berperan sebagai pembawa sinyal antar sel saraf dan berdampak langsung pada pengaturan suasana hati, proses belajar, memori, serta fungsi kognitif secara keseluruhan (Dalangin *et al*, 2020). Kekurangan protein, terutama pada masa-masa penting perkembangan otak, dapat mengakibatkan penurunan neurogenesis atau pembentukan neuron baru, yang pada gilirannya dapat memengaruhi plastisitas otak, atau kemampuannya untuk beradaptasi dan memperbaiki diri, serta memengaruhi kemampuan berpikir jangka panjang (Marzola *et al,* 2023; Murphy *et al,* 2014). Pada hewan percobaan, asupan protein yang cukup terbukti tidak hanya mendukung pembentukan sinapsis, tetapi juga meningkatkan ketahanan sel saraf terhadap stres oksidatif, yang merupakan salah satu faktor risiko utama penuaan dan penurunan kognitif (Xinglong *et al,* 2014). Penelitian tentang dampak nutrisi pada kesehatan otak menunjukkan bahwa pola makan kaya protein, serta suplemen nutrisi tertentu, berperan dalam mendukung neurogenesis, regulasi neurotransmiter, dan fungsi memori. Diet yang seimbang dan kaya nutrisi terbukti berpotensi dalam pemulihan serta pencegahan penurunan fungsi otak akibat faktor-faktor seperti penuaan dan gangguan metabolik (Fado *et al,* 2022).

1. **Peran Protein dalam Neurogenesis**

   Asam amino dari protein berperan penting dalam neurogenesis, terutama sebagai komponen esensial untuk sintesis neurotransmiter dan pemeliharaan struktur jaringan saraf yang mendukung kesehatan otak (Mendez-Maldonado *et al,* 2020). Neurogenesis, yaitu proses pembentukan neuron baru, terjadi secara aktif di area tertentu di otak, seperti hipokampus, yang berperan penting dalam memori dan pembelajaran (Toda *et al,* 2019). Untuk mendukung neurogenesis, otak membutuhkan asam amino esensial yang diperoleh dari pemecahan protein dalam makanan. Asam amino ini berperan sebagai bahan dasar dalam pembentukan neuron, sinapsis, dan berbagai komponen seluler lain yang mendukung struktur dan fungsi otak (Gomez-Pinilla, 2008). Tanpa asupan protein yang cukup, suplai asam amino menjadi terbatas, sehingga menghambat proses neurogenesis. Penelitian menunjukkan bahwa diet rendah protein dapat menurunkan jumlah sel saraf yang terbentuk, yang berpotensi memengaruhi kemampuan adaptasi dan pembelajaran individu (Roshankhah et a, 2019).

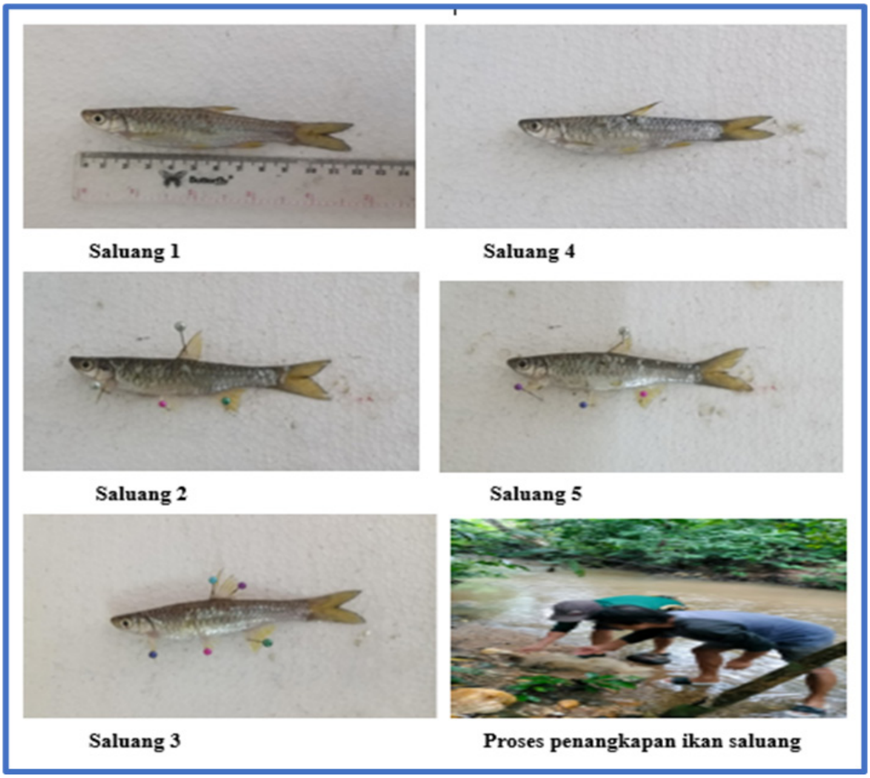
   Selain mendukung pembentukan sel saraf baru, protein juga berperan dalam pemeliharaan dan perbaikan jaringan saraf yang sudah ada**.** Pemeliharaan jaringan saraf sangat bergantung pada protein untuk menjaga stabilitas sinapsis dan mendukung proses neuroplastisitas,

BAB 5

IKAN SELUANG SEBAGAI SUMBER PANGAN UNGGULAN

A. Toksonomi ikan seluang (*Rasbora borneensis*)

Ikan saluang memiliki banyak subspesies, salah satunya Rasbora borneensis yang diperoleh dari Sungai Riam Kanan, Desa Tiwingan Lama, Kecamatan Aranio, Kabupaten Banjar. Ikan saluang yang diperoleh dari daerah tersebut diidentifikasi dan diklasifikasikan di Laboratorium Iktiologi dan Biologi Perikanan Universitas Lambung Mangkurat. Berdasarkan determinasi anatomi luar, ikan ini termasuk famili *Cyprinidae* dan diklasifikasikan sesuai nama ilmiah, lokal, dan perdagangan (Haitami, Triawanti, Panghiyangani R, Sanyoto DD, Kaidah S, Hariadi D, 2025). Deskripsi morfologisnya (Gambar 5.1) menunjukkan ciri khas yang membedakannya dari spesies lain di kawasan tersebut, mendukung distribusinya yang luas di Sungai Riam Kanan, Kalimantan Selatan.



Sumber: photo pribadi (Haitami, Triawanti, Panghiyangani R, Sanyoto DD, Kaidah S, Hariadi D, 2025)

Gambar 5.1. Morfofologi dan Proses Penangkapan Ikan Saluang

Keterangan gambar:

Karakter

Rangka terdiri dari tulang keras. Kepala simetris. Bentuk tubuh pipih dan memanjang (*compress-elongated*). Badan bersisik, tipe sikloid. Mempunyai linea lateralis terletak diatas sirip dada. Pada sisi kiri dan kanan linea lateralis terdapat bayangan garis hitam yang samar. Mulut kecil dan tidak dapat disembulkan. Posisi mulut disebut inferior, dimana rahang bawah lebih panjang dari rahang atas. Tidak memiliki sungut. Bibir licin. Hidung memiliki 2 lubang berada diatas bibir. Mata bulat berwarna putih dengan pupil hitam. Tidak mempunyai gigi. Sirip punggung terdiri dari jari-jari lemah. Sirip perut jauh ke belakang, di muka sirip dubur, posisi sirip

BAB 6

KACANG NEGARA (*VIGNA UNGUICULATA SPP CYLINDRICA*) SEBAGAI SUMBER PANGAN UNGGULAN

A. Toksonomi Kacang Negara

Di Kecamatan Nagara, Kabupaten Hulu Sungai Selatan, tepatnya di Desa Samuda, Baruh Jaya Pandak Daun, tumbuh sejenis kacang unik yang dikenal dengan nama kacang nagara. Kacang ini memiliki nama ilmiah *Vigna unguiculata spp*. *Cylindrica* dan menjadi salah satu kekayaan alam lokal yang menarik perhatian para peneliti. Suatu penelitian dilakukan untuk menggali potensi kacang nagara, khususnya sebagai sumber protein nabati. Namun, sebelum dimanfaatkan, kacang nagara terlebih dahulu melalui proses identifikasi dan determinasi di Laboratorium Dasar Universitas Lambung Mangkurat. Proses determinasi dilakukan dengan mengamati anatomi luar kacang serta merujuk pada klasifikasi ilmiahnya, termasuk nama ilmiah dan nama lokal. Hasil penelitian menunjukkan bahwa kacang nagara memiliki ciri morfologis yang khas, membedakannya dari jenis kacang lain yang tumbuh di daerah berbeda (Haitami, Triawanti, Panghiyangani R, Sanyoto DD, Kaidah S, Hariadi D, 2025).

Sumber: Dari photo pribadi (Haitami, Triawanti, Panghiyangani R, Sanyoto DD, Kaidah S, Hariadi D, 2025).

Gambar 6.1. Kacang Nagara dalam Bentuk Segar dan Kering

Keterangan Gambar:

Habitus

Semak

Daun

Daun terdiri dari tiga helaian daun (trifoliate), letak berseling, warna hijau, berbentuk oval, ataupun lancet, panjang daun 6,5 – 16 cm dan lebar daun 4 – 10 cm, panjang tangkai daun 5 – 15cm

Batang

Batang bersegi enam, berwarna hijau

Akar

Akar serabut

BAB 7

MODEL PENELITIAN INTERVENSI GIZI DAN NEUROKOGNITIF PADA HEWAN COBA

A. Hewan Coba Tikus dan Neurokognitif

Penggunaan tikus sebagai hewan coba dalam penelitian neurokognitif, khususnya dalam konteks pengujian fungsi otak dan memori spasial, didasari oleh sejumlah alasan ilmiah yang kuat. Tikus memiliki struktur otak yang memungkinkan pengukuran respons memori dan pembelajaran, sehingga mereka sering digunakan dalam pengujian regulasi neurotoksisitas yang berfokus pada pembelajaran spasial (Vorhees and Williams, 2024). Tikus menunjukkan respons terhadap rangsangan emosional manusia yang mengalami kondisi takut, terutama melalui aktivasi area basolateral dan sentromedial dari amigdala. Respons ini menunjukkan bahwa tikus dapat merasakan perubahan emosional lintas spesies, dan reaksi mereka terhadap sinyal lingkungan yang penuh ancaman memungkinkan kita memahami bagaimana respons pertahanan ini mungkin berperan dalam situasi serupa pada manusia (Jiang *et al.*, 2017). Penelitian oleh Wijnen *et al.* (2024) menunjukkan bahwa tikus memiliki kemampuan memori spasial dan perilaku yang kompleks, yang dapat diukur melalui berbagai uji labirin dan aktivitas eksplorasi (Wijnen, Genzel and van der Meij, 2024). Selain itu, Penggunaan tikus dalam penelitian memungkinkan observasi jangka panjang terhadap dampak diet lunak, yang dapat memengaruhi fungsi otak, perilaku, dan suasana hati mereka, sehingga memberikan wawasan mendalam mengenai efek jangka panjang dari perubahan diet pada kognisi dan emosi (Furukawa *et al.*, 2023).

Kekurangan nutrisi, terutama protein dapat berdampak signifikan pada perkembangan otak tikus, yang serupa dengan dampak yang ditemukan pada manusia (Jiang *et al.*, 2017). Dalam konteks pemulihan kognitif, penelitian oleh Bétourné, *et al* (2018) menunjukkan bahwa gangguan pada fungsi hipokampus, terutama melalui perubahan jalur *protein kinase C* (PKC), dapat menyebabkan gangguan pada memori spasial dan pembelajaran pada tikus, yang merupakan area penting untuk mengamati efek jangka panjang pada fungsi kognitif. Pada saat pemulihan nutrisi diberikan, tikus-tikus ini memperlihatkan peningkatan kapasitas memori dan kinerja dalam uji labirin, mendukung hipotesis bahwa asupan nutrisi yang memadai berperan penting dalam pemulihan fungsi neurokognitif (Bétourné *et al.*, 2018). Hal ini menunjukkan bahwa Tikus digunakan sebagai model efektif untuk memahami bagaimana nutrisi tertentu, seperti protein, asam lemak omega-3 dan polifenol, dapat meningkatkan neuroplastisitas di hipokampus, yang merupakan area penting dalam proses memori dan pembelajaran (Melgar-Locatelli *et al.*, 2023).

Selanjutnya, tikus juga memiliki keuntungan dalam hal biaya dan etika dibandingkan model hewan lainnya, seperti primata, yang lebih mahal dan memiliki lebih banyak batasan etis dalam penelitian neurokognitif . Tikus dapat diternakkan dalam jumlah besar dan mudah diatur dalam pengaturan eksperimental, yang memungkinkan para peneliti melakukan pengujian yang lebih ekstensif tanpa mengabaikan standar kesejahteraan

BAB 8
PENUTUP

Kesehatan otak merupakan fondasi penting dalam menunjang kapasitas kognitif, pembelajaran, serta kestabilan emosional individu di berbagai tahapan kehidupan. Berbagai penelitian telah menunjukkan bahwa pemenuhan gizi, terutama asupan protein yang memadai, memainkan peranan vital dalam mendukung fungsi-fungsi tersebut melalui mekanisme biologis seperti neurogenesis, plastisitas sinaptik, dan regulasi neurotransmiter. Ketika kebutuhan protein tidak terpenuhi, terjadi disrupsi signifikan pada struktur dan fungsi otak, termasuk gangguan pada hipokampus, penurunan ekspresi BDNF, serta kerusakan sinapsis yang menyebabkan defisit kognitif. Di Indonesia, khususnya di wilayah pedesaan, fenomena kekurangan protein masih menjadi tantangan yang nyata, sehingga diperlukan strategi intervensi berbasis bahan lokal yang bernilai gizi tinggi, terjangkau, dan dapat diterima secara budaya.

Dalam konteks ini, pemanfaatan ikan saluang (Rasbora spp.) sebagai sumber protein hewani dan kacang Nagara (Vigna unguiculata spp.

cylindrica) sebagai sumber protein nabati menawarkan peluang besar. Ikan saluang, yang secara tradisional telah dikonsumsi oleh masyarakat Kalimantan Selatan, terbukti mengandung asam amino esensial penting yang berkontribusi dalam meningkatkan kapasitas memori spasial dan mempertahankan integritas struktur neuron. Sementara itu, kacang Nagara memiliki kandungan protein tinggi serta senyawa bioaktif yang mendukung aktivitas neuroprotektif dan antioksidan, menjadikannya pilihan yang menjanjikan dalam upaya perbaikan fungsi otak pasca defisiensi protein. Kedua komponen pangan ini, jika dikombinasikan dalam satu formulasi diet yang terstruktur, berpotensi menciptakan sinergi nutrisi yang memperkuat proses pemulihan saraf, meningkatkan kadar BDNF, serta mengurangi stres oksidatif yang menjadi pemicu kemunduran kognitif.

Lebih jauh, pendekatan berbasis pangan lokal ini tidak hanya menjawab tantangan malnutrisi dari sisi medis, tetapi juga memiliki dimensi sosial dan ekonomi yang luas. Melalui diversifikasi produk olahan seperti nugget ikan saluang atau biskuit berbasis kacang Nagara, masyarakat dapat memperoleh alternatif sumber protein yang praktis, lezat, dan bernilai jual tinggi. Hal ini membuka ruang untuk pengembangan industri rumahan yang berbasis pada potensi pangan daerah, sekaligus mendorong terciptanya sistem pangan mandiri yang berkelanjutan. Intervensi ini selaras dengan agenda pembangunan nasional dalam peningkatan ketahanan gizi, penguatan ekonomi lokal, dan pelestarian biodiversitas pangan Indonesia. Oleh karena itu, riset lanjutan yang berfokus pada pengaruh kombinasi kedua bahan ini terhadap biomarker neurokognitif dan performa kognisi sangat diperlukan, baik dalam skala laboratorium maupun aplikasi komunitas.

Dengan demikian, buku ini menegaskan bahwa solusi atas masalah kesehatan otak akibat kekurangan protein dapat ditemukan dalam kekayaan hayati lokal yang selama ini kurang dimanfaatkan secara optimal. Ikan saluang dan kacang Nagara bukan hanya sekadar bahan pangan, melainkan aset strategis yang menyimpan potensi ilmiah dan praktis

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SUPERFOOD

POTENSI IKAN SALUANG DAN KACANG NAGARA

SEBAGAI NUTRISI OTAK

Buku ini mengupas secara ilmiah dan aplikatif potensi ikan saluang dan kacang nagara sebagai sumber pangan bergizi tinggi yang mampu menunjang fungsi dan kesehatan otak. Penulis mengulas kandungan nutrisi keduanya, seperti asam lemak omega-3, protein, serta antioksidan, yang berperan penting dalam mendukung perkembangan kognitif dan menjaga daya ingat.

Melalui pendekatan riset dan data empiris, buku ini menyajikan hasil-hasil studi yang membuktikan manfaat konsumsi ikan saluang dan kacang nagara dalam meningkatkan performa mental dan mencegah penurunan fungsi otak akibat penuaan atau gaya hidup modern. Disertai pula dengan pembahasan mengenai budaya konsumsi lokal yang mendukung keberlanjutan superfood ini.

Lebih dari sekadar referensi akademik, buku ini juga menjadi panduan praktis bagi masyarakat, pendidik, dan pelaku industri pangan untuk mengeksplorasi dan mengembangkan sumber daya lokal sebagai solusi nutrisi masa depan yang alami, terjangkau, dan berkelanjutan.

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